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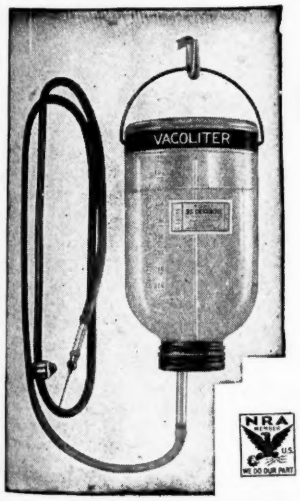

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The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held in Boston.

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The New England
Journal of Medicine

VOLUME 211 JULY 12, 1934 NUMBER 2

A CASE OF HYPERINSULINISM WITHOUT DEMONSTRABLE PANCREATIC CHANGES IN AN ELEVEN YEAR OLD CHILD*

BY JOHN A. BOONE, M.D.†

THERE are three disorders of the insulin-producing islets of Langerhans: diabetes mellitus, or underproduction of insulin; hyperinsulinism, or overproduction, and dysinsulinism, which is something of a combination of the other two. The characteristics of diabetes mellitus are well known to physicians. The subject of hyperinsulinism has been given a good deal of attention in the literature since its occurrence was first suggested ten years ago by Seale Harris[1]. The disease is characterized by a consistently low blood sugar, with resulting symptoms of hunger, weakness, nervousness, tremors, sweating, trembling and mental lapses, and in severe cases, unconsciousness and convulsions. Dysinsulinism apparently results from lack of control over insulin secretion. Patients suffering from it are usually under treatment for diabetes, when they are observed, either spontaneously or following small doses of insulin, to go into hypoglycemia, and these sudden and unexpected variations in blood sugar level often render control of the disorder very difficult.

The literature pertaining to the latter two disturbances has been collected and very well discussed by Seale Harris in a recent paper[2]. A number of patients with hyperinsulinism have been operated upon or have come to autopsy, with the discovery of adenomas consisting of pancreatic islet cells[3, 4] or of carcinomas with the same histologic basis[5, 6]. In cases where operative removal of the tumor was possible, complete and lasting relief of symptoms and rise of blood sugar to normal levels were obtained. In several cases in which operation was done, however, nothing in the way of pancreatic abnormality was found, and Harris describes many cases with hypoglycemic symptoms who subsequently developed true diabetes, suggesting that a transitory disturbance of insulin mechanism is often a premonitory symptom in the genesis of diabetes mellitus. As more and more cases of hyperinsulinism are reported, it appears that some niceties of judgment will frequently arise in deciding whether a given case should be given the benefit of abdominal exploration. Much the same kind of problem arises also in deciding for or against subtotal resection of the pancreas in case no tumor is found at operation.

The milder cases of hyperinsulinism can be handled very successfully by medical-dietetic treatment. At first thought it might seem that frequent carbohydrate feedings would be indicated for preserving the normal blood sugar level, but experience has shown that this purpose is best served by frequent feedings of *low* carbohydrate value, presumably because the postprandial hyperglycemia stimulates the islet cells to increased secretory activity. One author has even used small doses of insulin after meals to restrain a sudden rise in blood sugar, apparently with good success[7]. The case presented here seems worthy of reporting in some detail, since all these problems came up for consideration, and because several interesting sidelights appeared during the course of a rather extensive work-up.

CASE HISTORY OF P. R. F.

Hosp. No. 331337—O. P. D. No. 279371

This eleven year old schoolgirl of native American parentage entered the hospital August 18, 1933 complaining of recurrent attacks of partial coma during the past four months. She had been perfectly well until four months before when she came home from school one afternoon complaining of dizziness. That evening during supper the child had her first attack. She sat upright in her chair staring straight ahead, took no food and refused to say anything except that she was all right. A doctor was called, who said she had a case of "nerves". About one month later while taking a bath before breakfast a somewhat similar attack occurred. Her face became pale and she complained of dizziness. After lying down for twenty minutes she seemed normal again. The following day while playing in the yard shortly before supper she fainted and fell to the ground. She had no convulsive movements and was quite limp. She was soon roused, but acted peculiarly for about half an hour. One week later while her mother was trying to get her out of bed to keep an appointment at another hospital she had a subsequent attack. She was taken to that hospital, but no diagnosis was made. One week before entry she was again in the same hospital where x-rays of the knees, skull and chest were taken. An abstract of her record there states that the skull and chest were normal, and that x-rays of the knees showed no evidence of lead poisoning. She was then referred to the Mass-

*From the Children's Medical Service of the Massachusetts General Hospital.

†Boone, John A.—House Officer, Children's Medical Department, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 89.

achusetts Eye and Ear Infirmary for eye examination and refraction.

While taking her turn in the Eye and Ear Infirmary among a long line of patients, the child missed her noonday meal. At about two o'clock in the afternoon in the process of refraction she fainted and could not be roused. She remained in this condition about an hour, and for the first time had a few convulsive twitchings of her shoulders and face, and voided involuntarily. It was on this occasion that we first saw her.

The past history disclosed that she had been a full-term, normal delivery, weighing nine pounds at birth. She was breast-fed, gained and developed normally. The first teeth appeared at seven months; she walked and talked at one year. She had pneumonia at fifteen months and measles at three years. There were three operations for drainage of abscessed cervical glands before the tonsils and adenoids were removed at four years. The system history was routinely negative. The diet seemed adequate, but the child had to be coaxed to eat her meals and seemed to have a poor appetite for breakfast. She would become angry and refuse to eat. There seemed to be considerable family strife over this problem, though there had been no loss in weight. She would lie awake quite late at night, and slept poorly. She had done nicely in school, never being refused promotion, and was entering the seventh grade. She played well with other children, but since the onset of the present illness had been rather irritable. The family history showed the father, mother and two siblings living and well. There were no miscarriages or stillbirths, and no history of familial disease, including tuberculosis, lues, diabetes, epilepsy, insanity and blood dyscrasias. No one in the family had ever showed symptoms similar to those of the patient.

Physical examination on admission disclosed a well-developed but somewhat small girl for eleven years lying in bed semi-comatose. She could with difficulty be aroused to stare with a peculiar injured expression at the examiner, but did not respond to questions. The pupils were dilated by medication given in the eye clinic for refraction, but on subsequent examination were normal in appearance and reactions. The fundi showed slight pallor of the temporal side of both discs, but were otherwise normal. The lips and mucous membranes were rather pale, and the teeth were in very poor condition, there being many decayed teeth, jagged root snags and some gingivitis. The throat was clear. There were many palpable posterior cervical glands, but no stiffness of the neck. The chest was clear. The heart was not enlarged, and there were no murmurs or thrills. The rate was sixty, the sounds of good quality, slightly irregular but apparently only sinus arrhythmia. The pulse seemed rather full and strong. Abdomen, extremities and genitalia were negative. Reflexes were normal except that no abdominals could be obtained and there was dorsiflexion of both great toes on plantar stimulation. The entire body was quite limp. The hands and feet were rather cold, moist and clammy, but there was no excessive perspiration.

In view of the suggestive relation between her attacks and periods of going without food, she was with difficulty made to swallow four ounces of orange juice, the only readily available carbohydrate. She sank back into her stupor, and was brought to the ward. By supper time she was conscious and apparently entirely normal. Blood pressure was 120/80. Urine and stool examinations were negative. The blood showed a red cell count of 4,900,000 and hemoglobin 80 per cent (Sahli). The white cell count was 7,500, of which 70 per cent were polymorphonuclears, 23 per cent lymphocytes, 5 per cent large mononuclears, 2 per cent eosinophiles and no basophiles. The Hinton test of the blood and the Mantoux tuberculin test were negative. The weight was 58.5 lb. (26.6 kg.). CO_2 combining power of the blood was 56.7 volumes per cent. Basal metabolism was +15 per cent on the basis of either height or weight. X-rays of the skull and a flat plate of the abdomen were negative.

The morning after admission the fasting blood sugar (Folin-Wu) was 40 mg. per 100 cc. In table 1 are listed all the recorded values of the fasting morning blood sugar; all were taken approximately sixteen hours after food.

TABLE 1

Aug. 19	40	mg./100 cc.	Sept. 12	59	mg./100 cc.
Aug. 21	54	"	Sept. 13	56	"
Aug. 23	58	"	Jan. 9	47	"
Aug. 24	73	"	Jan. 13	54	"
Aug. 29	63	"	Jan. 30	44	"
Sept. 3	46	"	Feb. 15	46	"

Two days after admission a sugar tolerance test was done after 100 Gm. of glucose by mouth. The curve obtained is composed with an average normal curve in figure 1.

After four days on the ward, the patient had had no attacks. Since such a marked hypoglycemia and increased sugar tolerance had been demonstrated, it was decided to determine if an attack could not be brought on by starvation. Accordingly, she received no food the next day. At 8:30 A.M. she was bright, alert and hungry. The blood sugar was fifty-eight mg. At about 10:30, she put down the book she had been reading and seemed somewhat less interested in her surroundings. At 12:00 noon she was sleeping, but could be easily aroused. The blood sugar was thirty-seven mg. She continued becoming harder and harder to arouse, only opening her eyes and staring with an injured expression at the observer, and did not respond to questions. At one P.M. the blood sugar was forty mg. During the next hour, vigorous shaking was necessary to arouse her. The blood pressure was 120/55. The pulse was always full and strong, reflexes were all normal. By two P.M. the condition had progressed until about thirty seconds stimulation were necessary to cause the eyes to open. She was quite limp. The reflexes were normal. The pulse seemed a little irregular, and the blood pressure was 140/80. The blood sugar at two P.M. was thirty-nine mg. She was then given fifty cc. of 10 per cent glucose intravenously. In thirty seconds she would answer questions, but seemed bewildered and was crying. In two minutes she was sitting up in bed, laughing, quite responsive, and asking for something to eat.

The following day another glucose tolerance test was done, this time determining simultaneously the capillary and venous blood sugar, and also the blood fat. The results are plotted in figure 2.

The blood fat is seen to vary inversely with the blood sugar level. It had been hoped that excess insulin activity in the tissues would be expressed in a marked difference between capillary and venous sugar, but the difference obtained is no more than would normally be expected. It will be noted that the blood sugar was considerably higher on this occasion than in the first tolerance test three days before, and a diabetic type of curve was obtained.

On September 13 a simultaneous fasting blood sugar and lumbar puncture were done. The blood sugar was fifty-six mg., and the spinal fluid sugar

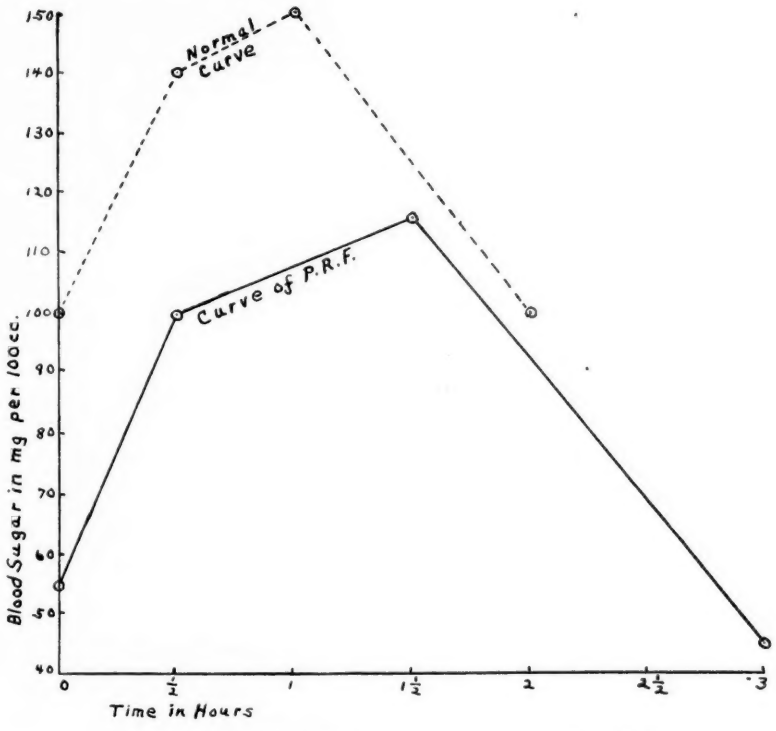

FIGURE 1. Venous blood sugar tolerance curve after 100 Gm. glucose by mouth.

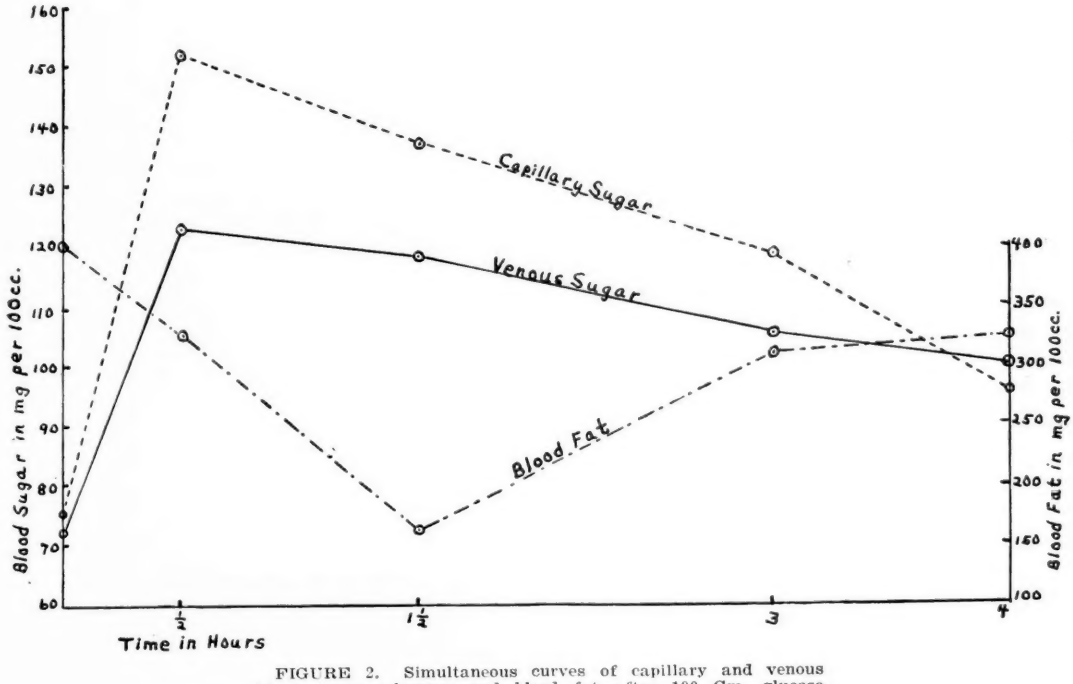

FIGURE 2. Simultaneous curves of capillary and venous blood sugar tolerance and blood fat after 100 Gm. glucose by mouth.

thirty-four mg. The other spinal fluid findings were as follows: normal pressure, no cells, total protein twenty-six mg. per 100 cc., chloride 737 mg. per 100 cc., Wassermann negative, colloidal gold 0000000000. The patient still had had no spontaneous attacks in the hospital. Accordingly, a second starvation experiment was attempted, but this time resulted in failure to produce symptoms, though the blood sugar levels were near those of the previous experiment. The serum phosphorus was also determined on this occasion, and the results appear in table 2.

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Sept. 3	46 "	Feb. 15	46 "

Two days after admission a sugar tolerance test was done after 100 Gm. of glucose by mouth. The curve obtained is composed with an average normal curve in figure 1.

After four days on the ward, the patient had had no attacks. Since such a marked hypoglycemia and increased sugar tolerance had been demonstrated, it was decided to determine if an attack could not be brought on by starvation. Accordingly, she received no food the next day. At 8:30 A.M. she was bright, alert and hungry. The blood sugar was fifty-eight mg. At about 10:30, she put down the book she had been reading and seemed somewhat less interested in her surroundings. At 12:00 noon she was sleeping, but could be easily aroused. The blood sugar was thirty-seven mg. She continued becoming harder and harder to arouse, only opening her eyes and staring with an injured expression at the observer, and did not respond to questions. At one P.M. the blood sugar was forty mg. During the next hour, vigorous shaking was necessary to arouse her. The blood pressure was 120/55. The pulse was always full and strong, reflexes were all normal. By two P.M. the condition had progressed until about thirty seconds stimulation were necessary to cause the eyes to open. She was quite limp. The reflexes were normal. The pulse seemed a little irregular, and the blood pressure was 140/80. The blood sugar at two P.M. was thirty-nine mg. She was then given fifty cc. of 10 per cent glucose intravenously. In thirty seconds she would answer questions, but seemed bewildered and was crying. In two minutes she was sitting up in bed, laughing, quite responsive, and asking for something to eat.

The following day another glucose tolerance test was done, this time determining simultaneously the capillary and venous blood sugar, and also the blood fat. The results are plotted in figure 2.

The blood fat is seen to vary inversely with the blood sugar level. It had been hoped that excess insulin activity in the tissues would be expressed in a marked difference between capillary and venous sugar, but the difference obtained is no more than would normally be expected. It will be noted that the blood sugar was considerably higher on this occasion than in the first tolerance test three days before, and a diabetic type of curve was obtained.

On September 13 a simultaneous fasting blood sugar and lumbar puncture were done. The blood sugar was fifty-six mg., and the spinal fluid sugar

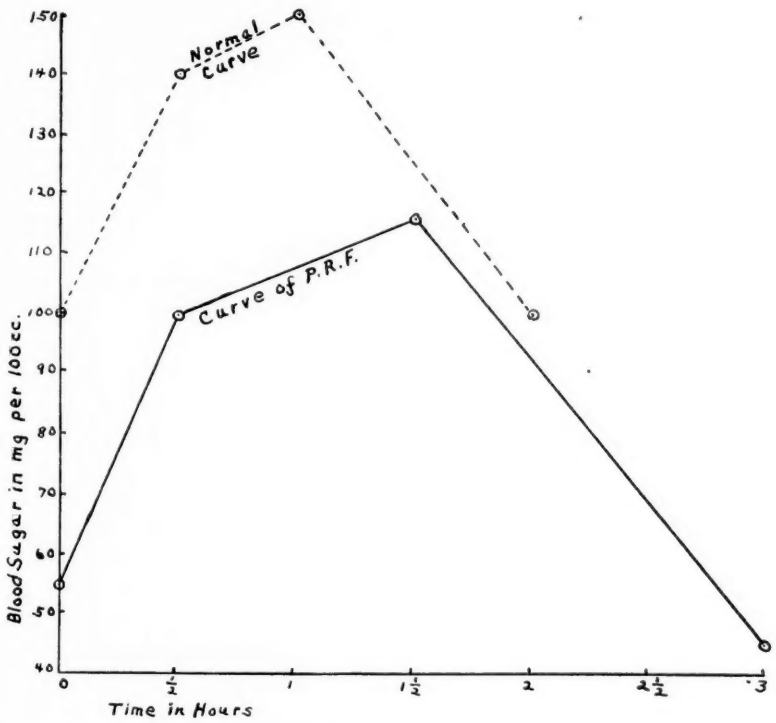

FIGURE 1. Venous blood sugar tolerance curve after 100 Gm. glucose by mouth.

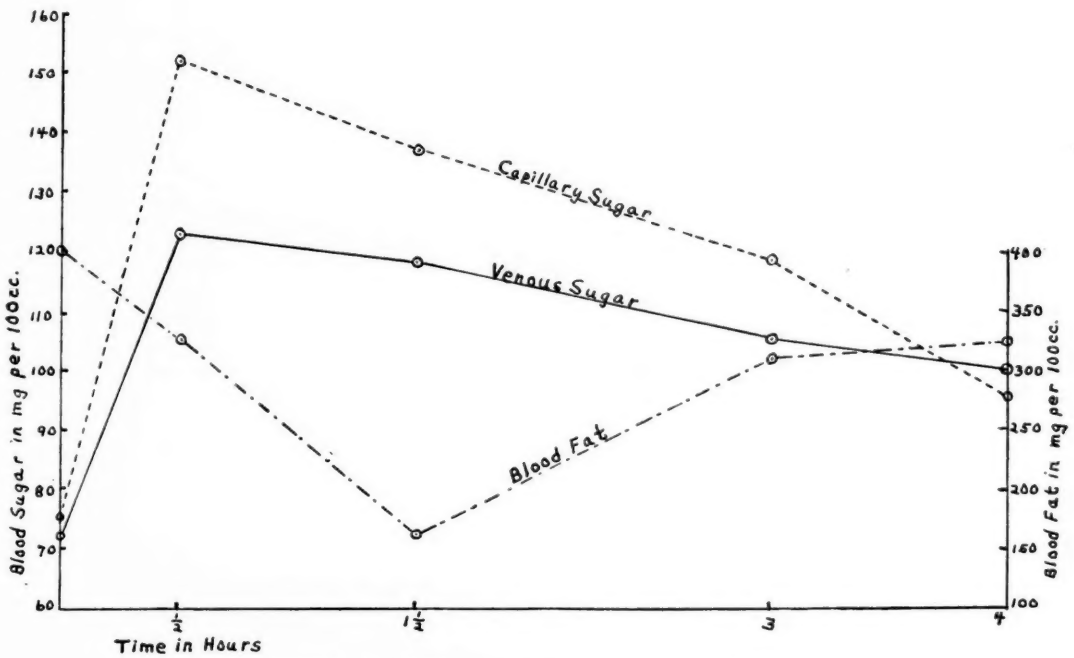

FIGURE 2. Simultaneous curves of capillary and venous blood sugar tolerance and blood fat after 100 Gm. glucose by mouth.

thirty-four mg. The other spinal fluid findings were as follows: normal pressure, no cells, total protein twenty-six mg. per 100 cc., chloride 737 mg. per 100 cc., Wassermann negative, colloidal gold 0000000000. The patient still had had no spontaneous attacks in the hospital. Accordingly, a second starvation experiment was attempted, but this time resulted in failure to produce symptoms, though the blood sugar levels were near those of the previous experiment. The serum phosphorus was also determined on this occasion, and the results appear in table 2.

Since the patient had had no attacks during one month in the hospital, except one induced by starvation, and this could not be repeated three weeks later, it was felt that provided she did have an adenoma of the islet cell type, it was probably a small one and might be difficult to find at operation. The consensus was that the child should be allowed to return home on a high carbohydrate diet, to be followed weekly in the out-patient department. It was thought that a carcinoma was very unlikely, and that every opportunity should be given the supposed adenoma to increase in size before operation became necessary.

TABLE 2

Time:	Blood Sugar:	Phosphorus:	Condition:
9:00 A.M.	56 mg./100 cc.	4.48 mg./100 cc.	Wide-awake
3:40 P.M.	36 "	4.70 "	Slightly drowsy
4:40 P.M.	39 "	4.70 "	Wide-awake

The child did well at home, reporting at frequent intervals to the out-patient department. A fasting blood sugar one month after discharge showed fifty-six mg. A few times the mother found her unusually drowsy on rising, but she always brightened after breakfast. Three and a half months after discharge, she was allowed to sleep through breakfast, and about eleven A.M. her mother found that she could not be aroused. She managed to swallow a glass of orange juice and corn syrup and the stupor soon passed off. One week later there was considerable unsteadiness of gait until breakfast was eaten. Her mother asserted that she ate large meals at noon and night, but seemed to lack much appetite for breakfast. Because it seemed that her attacks were getting out of control, she was again admitted to the hospital January 8, 1934.

A fasting blood sugar the morning after entry showed forty-seven mg. per 100 cc. The fasting was continued until 2:30 P.M. without producing an attack, though the blood sugar at that time was thirty-two mg. A subsequent trial at bringing on coma by starvation failed, the blood sugar after twenty-four hours without food being forty-two mg. It was evident now that there was no definite threshold of blood sugar level for the occurrence of symptoms, and an attempt was made to find what other factors might be operating. Considering that insulin reactions sometimes occur in diabetics at unusually high blood sugar values, it seemed worthwhile to determine whether some shift of acid-base equilibrium or water balance might be a factor.

For one day the patient was given one Gm. doses of NH_4Cl every two hours. Breakfast was omitted next day, and NH_4Cl continued. By 1:30 P.M. she could not be roused, the blood sugar being thirty-six mg. She was given with difficulty four oz. of orange juice and cane sugar by mouth. Within the next ten minutes she gradually became her normal self. Three other starvation experiments using NH_4Cl regularly produced deep stupor, at blood sugar levels of forty-three, forty and thirty-seven, respectively. A last starvation experiment, omitting NH_4Cl, was without result, although the blood sugar fell to thirty-four. While interpretation of such results is beyond the scope of this report, there is ap-

TABLE 3

	Fasting:	After food:			
		30 min.	1 hr.	2 hrs.	3 hrs.
Patient:	0.87	1.11	1.23	—	—
"	0.78	1.06	1.00	0.90	0.89
Control:	0.82	0.82	0.97	0.96	0.97

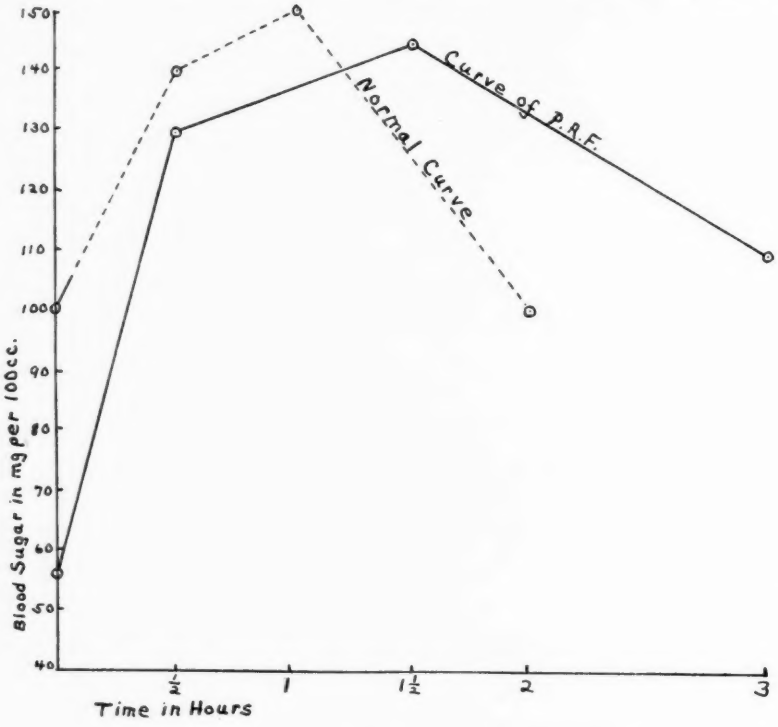

FIGURE 3. Venous blood sugar tolerance curve after 100 Gm. glucose by mouth.

parently a true relationship between some influence of NH_4Cl and the threshold of this patient's hypoglycemic symptoms.

It was thought that respiratory quotients determined before and after a high carbohydrate meal might show interesting changes. Two of these were done, and appear in table 3 compared with one on a control child of the same age and sex who was convalescing from acute rheumatic fever. The meal was composed of carbohydrate 92.5 Gm., protein 18.5 Gm., fat 32.5 Gm.

The marked rise in value of the patient's respiratory quotient indicates rapid conversion of the ingested carbohydrate into fat, which is of interest in connection with the well-known tendency of these people to become obese.

The effect of epinephrin was tried on one occasion when the patient was in a deep stupor with a blood sugar of forty-three. One-half cc. of 1-1000 epinephrin was given subcutaneously. Fifteen minutes later she was still stuporous, with a blood sugar of forty-seven. Thirty minutes later she was pretty well awake and able to walk, with a blood sugar of seventy-four. It may be mentioned in passing that this was the most profound coma in which we had observed her, and it had been brought on with the aid of NH_4Cl. A similar trial of the effect of ⅜ grain of ephedrin when the blood sugar was forty-four resulted in no appreciable effect on either stupor or blood sugar level. A third glucose tolerance curve is shown in figure 3.

If the three glucose tolerance curves plotted for this patient are compared, it will be seen that she exhibits no one definite type of sugar tolerance. Only the first curve shows a markedly increased tolerance. The other two, except for the low fasting values, are rather of a diabetic type. Perhaps, as later developments showed, more attention should have been paid to the diverse character of these curves.

All who had seen the case and followed the laboratory studies, however, felt that she merited exploration for a possible islet adenoma of the pancreas. Accordingly, on February 3, operation was done by Dr. Beth Vincent, assisted by Dr. R. R. Linton. Dr. Francis Newton, who previously had successfully removed one of these tumors at the Peter Bent Brigham Hospital[8], was present and consulted freely with the operators. All the abdominal viscera, including liver and adrenals, were as far as could be determined perfectly normal. The pancreas was approached through the gastrocolic ligament, mobilized and thoroughly palpated. All who were present at the operation were satisfied that no tumor of any reasonable size had been overlooked. The operation was concluded after a small bit of the gland from the region of the tail had been removed for pathological examination. A subtotal resection of the pancreas was not done, because it was felt that considering the number of times such a syndrome has been reported to precede true diabetes, this child would be at a decided disadvantage should she be destined to develop diabetes later. The patient made an uneventful recovery from the operation, and was discharged home on frequent feedings of low carbohydrate content, as recommended by Seale Harris. Her symptoms are not yet severe enough not to be readily amenable to medical treatment, and she will be followed with interest to see whether the disturbance of insulin mechanism disappears after puberty, or diabetes develops, or the attacks become progressively more severe and require further exploration for a tumor. The specimen of pancreas removed at operation showed an abundance of islets, and one very large islet, but no definitely diagnostic abnormality.

REFERENCES

1 Harris, Seale: The etiology and prevention of diabetes. Virginia M. Monthly. 50:672 (Jan.) 1924.
2 Harris, Seale: Hyperinsulinism, a definite disease entity. J. A. M. A. 101:1958 (Dec. 16) 1933.
3 Smith, Margaret G., and Seibel, Marshall G.: Tumors of the islands of Langerhans and hypoglycemia. Am. J. Path. 7:723 (Nov.) 1931.
4 Graham, E. A., and Womack, N. A.: The application of surgery to the hypoglycaemic state due to islet tumors of the pancreas. Surg. Gynec. Obst. 56:728 (April) 1933.
5 Wilder, R. M., Allan, F. N., Power, M. H., and Robertson, H. E.: Carcinoma of the islands of the pancreas; hyperinsulinism and hypoglycemia. J. A. M. A. 89:348 (July 30) 1927.
6 Bast, T. H., Schmidt, E. R., and Sevringhaus, E. L.: Pancreatic tumor with hypoglycemic status epilepticus. Acta chir. Scandinav. 71:82, 1932.
7 John, Henry J.: In discussion of Harris' paper (Ref. 2), p. 1965.
8 Derick, C. L., Newton, F. C., Schulz, R. Z., Bowie, M. A., and Pokorny, N. A.: Spontaneous hyperinsulinism: report of a case of hyperinsulinism cured by surgical intervention. New Eng. J. Med. 208:293 (Feb. 9) 1933.

A NOTE ON THE INCIDENCE OF NEUROCIRCULATORY ASTHENIA WITH AND WITHOUT ORGANIC HEART DISEASE

BY JOSEPH C. EDWARDS, M.D.,* AND PAUL D. WHITE, M.D.*

INTRODUCTION

FOR centuries the differential diagnosis between organic heart disease and cardiac neuroses has puzzled physicians and so it continues to do to-day. Hippocrates recognized that palpitation might result from emotion and excitement, and Galen wrote of the effect of emotion on the heart. Corvisart in 1811 advised against regarding palpitations in all cases as evidences of heart disease. Williams in 1836 reflected on the powerful effect of the emotions and of sympathy upon the action of the heart, describing palpitation in the absence of organic disease. Austin Flint in 1859 also discussed this subject. Myers in 1870 was probably the first to describe in detail the condition known now as neurocirculatory asthenia. Da Costa in 1871 published an account of an affection called by him "The Irritable Heart of Soldiers", being a report of cases followed during and after the American Civil War. He was the first in America to describe the syndrome. Osler in 1887, Broadbent in 1897, and Allbutt in 1898 wrote of this functional disorder of the heart; Osler's paper was entitled "The Irritable Heart of Civil Life" and in it Osler stated that the same symp-

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toms and signs described by Da Costa in soldiers are not uncommon in civilians.

During the World War, Sir Thomas Lewis gave the name of "effort syndrome" to the condition and later published a monograph on the subject. In 1918, a new term was introduced —neurocirculatory asthenia ("N.C.A.")—first suggested by B. S. Oppenheimer, S. A. Levine, R. A. Morison, M. A. Rothschild, W. St. Lawrence, and F. N. Wilson, officers in the Medical Reserve Corps, U. S. A., attached to the Military Heart Hospital at Colchester, England, to study the condition under Sir Thomas Lewis. It is of interest that it is not now generally known who suggested this term. These six Americans conclude: "It would be a mistake to introduce in the American Army the name 'Disordered Action of the Heart' for, after a soldier has once been so labeled, it is difficult subsequently to persuade him that he is not suffering from organic heart trouble: this in itself retards his progress." Dr. Lewis' suggestion, "Effort Syndrome", in the sense that the symptoms are brought on or intensified by effort, is apt, but used with the implication that the syndrome is identical with that presented by a normal man after severe physical exertion, it involves us at once in a new discussion. Neurocirculatory asthenia was selected because it was "descriptive, non-committal, and shortened to 'N.C.A.', would be understood, and not misunderstood all along the line. . . ." In suggesting the name Neurocirculatory Asthenia ("N.C.A."), the authors emphasized that no theory as to the underlying pathogenetic process is implied: it is a practical, convenient term to apply to a well-defined syndrome in which certain nervous and circulatory symptoms are associated with an increased susceptibility to fatigue. As such the term has proved to be more satisfactory than any other and will doubtless continue to be so at least until such time as the one or probably several underlying mechanisms are discovered and defined. The variations in the symptom complex suggest that more than one simple uniform disorder underlies the condition.

The condition neurocirculatory asthenia is now widely and frequently recognized and the diagnosis correctly made in the majority of cases but there are still difficulties and frequent errors of judgment in diagnosing and treating neurocirculatory asthenia when it is superimposed on organic heart disease. Although the combination of these two conditions is known to exist, its incidence relative to that of organic heart disease of all types uncomplicated by neurocirculatory asthenia and to that of neurocirculatory asthenia uncomplicated by organic heart disease has not been sufficiently studied and reported. We have therefore made such an analysis.

PRESENT STUDY

In the present study we have analyzed a group of 5,000 consecutive private cases who sought advice in New England over a period of thirteen years for some complaint or symptom of heart trouble. It was decided to place the cases in which neurocirculatory asthenia occurred into three groups, Group 1 to include only those cases in which neurocirculatory asthenia occurred in the absence of clinical evidence of organic disease of the heart or circulatory system, Group 2 to include those cases in which neurocirculatory asthenia was complicated by organic heart disease, and Group 3 to include those cases which could not be definitely placed in the other groups, but in which neurocirculatory asthenia occurred with doubt as to the presence or absence of organic disease of the heart.

Of the 5,000 consecutive private cases, there were 687 cases, or 13.7 per cent, in which a definite diagnosis of neurocirculatory asthenia was made. The 448 uncomplicated cases in Group 1 form 65.2 per cent of the 687 cases in which neurocirculatory asthenia occurred, and are 8.9 per cent of the total of 5,000 patients with symptoms or complaints of heart disease. Group 2, with 135 cases, forms 19.6 per cent of the 687 cases, and 2.7 per cent of the 5,000 consecutive patients with cardiac symptoms or complaints. Group 3, with 104 cases, constitutes 15.2 per cent of the total of 687 cases of neurocirculatory asthenia, and is 2.1 per cent of the 5,000 cases studied. Among the 5,000 cases there were 2,854, or 57.1 per cent, with definite evidence of organic heart disease (this figure includes all patients with angina pectoris) and 433, or 8.7 per cent with doubt as to the presence of organic heart disease. Thus Group 2 above, consisting of 135 cases of neurocirculatory asthenia complicating definite organic heart disease makes up 4.7 per cent of the total definite "organic" group.

GROUP 1
(Uncomplicated cases of neurocirculatory asthenia)

Age	448 cases Female	Male	Total	Per cent of 448
0-10	1	1	2	0.4
11-20	21	15	36	8.2
21-30	70	40	110	24.4
31-40	80	47	127	28.3
41-50	70	41	111	24.5
51-60	34	19	53	12.2
61-	7	2	9	2.0
	283	165	448	100.0

Eighty-five and eight-tenths (85.8) per cent of the above cases are in the age group under 50, and 14.2 per cent over 50 years of age. Of the 448 cases in Group 1, 63.2 per cent are fe-

males and 36.8 per cent are males. Fifteen were women at the menopause.

GROUP 2

(Neurocirculatory asthenia complicating definite organic heart disease)

135 cases

Age	Female	Male	Total	Per cent of 135
0-10	0	0	0	0
11-20	1	1	2	1.6
21-30	23	3	26	19.1
31-40	17	12	29	21.5
41-50	12	15	27	20.0
51-60	19	11	30	22.2
61-	11	10	21	15.6
	83	52	135	100.0

Of these 135 cases in Group 2, 62.2 per cent are under 50 years of age, 37.8 per cent are over 50 years of age, 61.2 per cent are females, and 38.8 per cent are males.

GROUP 3

(Neurocirculatory asthenia complicating questionable organic heart disease)

104 cases

Age	Female	Male	Total	Per cent of 104
0-10	1	1	2	1.9
11-20	1	0	1	0.9
21-30	7	7	14	13.4
31-40	14	16	30	29.0
41-50	16	14	30	29.0
51-60	16	8	24	23.0
61-	3	0	3	2.8
	58	46	104	100.0

Of these 104 cases, 74.2 per cent are under 50 years of age, 25.8 per cent are over 50 years of age, 55.7 per cent are females, and 44.3 per cent are males.

TYPES OF HEART DISEASE COMPLICATING THE 135 CASES OF NEUROCIRCULATORY ASTHENIA IN GROUP 2

		Per cent
Rheumatic heart disease	60	44.4
Coronary disease (16 with angina pectoris)	29	21.4
Hypertensive heart	24	18.0
Both hypertension and coronary disease	3	2.2
Congenital heart disease	4	2.9
Cardiovascular lues	1	.7
STRUCTURAL CHANGE WITH ETIOLOGY OBSCURE		
Cardiac hypertrophy alone	6	10.4
Valvular involvement without rheumatic or luetic heart disease	4	
Other definite structural changes (such as the cor pulmonale)	4	
	135	100.0

Nearly one-half (44.4 per cent) of the patients who showed both neurocirculatory asthenia and organic heart changes had rheumatic heart disease, about one-fifth (21.4 per cent) had coronary disease, and about one-fifth (18.0 per cent) had hypertension with cardiac hypertrophy and in some cases signs of valvular disease; of the 29 (21.4 per cent) who had coronary disease, 16 had angina pectoris.

There was only one case of cardiovascular syphilis associated with neurocirculatory asthenia in our series. There were 14 cases (10.4 per cent) in which there was a definite structural change, either as hypertrophy or with valvular changes in the absence of any rheumatic history and of lues.

FURTHER DISCUSSION

Of the 687 cases, 424 (61.7 per cent) were females and 263 (38.3 per cent) were males, which closely corresponds to the sex incidence in each group. Most of the cases occurred in the third, fourth, and fifth decades. In the sixth decade, the incidence in the uncomplicated cases in Group 1 was about one-half the incidence in the other groups where organic heart changes or question of organic changes existed. In the seventh decade of life, there were about two times as many cases in Group 2 as in both the other groups combined. Group 2, consisting of the patients with organic changes, would naturally tend to have more cases in the older age groups. There were few cases in the first and eighth decades. Of the total series of 687 cases of neurocirculatory asthenia, 354 cases (51 per cent) were patients in the age group 31 to 50 years, inclusive.

It is thus evident that neurocirculatory asthenia may complicate any kind of organic heart disease and it is also true that it may produce all or most of the symptoms in such cases, symptoms which are frequently wrongly suspected of indicating congestive failure or angina pectoris.

It is also indicated by this study that although organic heart changes may complicate neurocirculatory asthenia, the chances that the patient coming to the consulting physician with symptoms of neurocirculatory asthenia will show no evidence of organic heart disease are approximately 3 to 1.

SUMMARY

In an analysis of 5,000 consecutive patients with cardiac symptoms and signs seen by us in private practice in New England over a period of thirteen years, we have found 687 cases (13.7 per cent) with definite neurocirculatory asthenia.

Of the 687 cases, 448 (65.2 per cent) were uncomplicated by organic heart disease. One hundred and thirty-five (19.6 per cent) were com-

plicated by organic heart disease, and there were 104 (15.2 per cent) in which neurocirculatory asthenia was present with doubt as to the presence or absence of organic heart changes. Of the 687 cases, 424 (61.7 per cent) were females and 263 (38.3 per cent) were males. Three hundred and fifty-four (51 per cent) of the 687 cases were patients in the age group 31 to 50 years inclusive.

Of the types of organic heart disease found with neurocirculatory asthenia in our series, rheumatic heart disease was most frequent (44.4 per cent), coronary disease second (21.4 per cent), and hypertensive heart disease third (18 per cent). There was only one case of cardiovascular syphilis.

From this experience we have found that the chances of a patient with symptoms of neurocirculatory asthenia coming to a consulting physician in New England to show no evidence of organic heart disease, are approximately 3 to 1. Even though organic heart disease be present, symptoms may be entirely the result of a complicating neurocirculatory asthenia.

We have looked up and recorded the origin of the term "neurocirculatory asthenia" (Oppenheimer, Levine, Morison, Rothschild, St. Lawrence, and Wilson, 1918).

REFERENCES

Allbutt, Thomas Clifford: A System of Medicine. New York: The Macmillan Company. 6: 821 and 851, 1893.

Broadbent, W. H., and Broadbent, J. F. H.: Heart Disease with Special Reference to Prognosis and Treatment. Chapter XXI, Functional Affections (so-called) of the Heart. New York: William Wood and Company. P. 315, 1897.

Corvisart, J. N.: Essai sur les maladies et les lésions organiques du coeur et des gros vaisseaux. Paris: Migneret. First Edition. 1806.

Da Costa, J. M.: On irritable heart; a clinical study of a form of functional cardiac disorder and its consequences. Am. J. M. Sc. 61: 17, 1871.

Flint, Austin: A Practical Treatise on the Diagnosis, Pathology and Treatment of Diseases of the Heart. Chapter IX, Functional Disorder of the Heart. Philadelphia: Blanchard and Lea. First Edition. P. 403, 1859.

Lewis, Thomas: The Soldier's Heart and the Effort Syndrome. New York: Paul B. Hoeber, 1919.

Myers, A. B. R.: On the Aetiology and Prevalence of Diseases of the Heart Among Soldiers. London. P. 22, 1870.

Oppenheimer, B. S.; Levine, S. A.; Morison, R. A.; Rothschild, M. A.; St. Lawrence, W.; and Wilson, F. N.: Illustrative cases of neuro-circulatory asthenia. Mil. Surgeon. 42: 711, 1918.

Osler, Sir William: The irritable heart of civil life. Canad. J. M. & S. 15: 617, 1886-87.

Viko, L. E.: Cardiac neurosis associated with rheumatic valvular heart disease. Am. Heart J. 1: 539, 1926.

White, P. D.: Observations on functional disorders of the heart. Am. Heart J. 1: 527, 1926.

The incidence of heart disease in Massachusetts. Boston M. & S. J. 196: 689, 1927.

Heart Disease. New York: The Macmillan Company. Chapter XXI, 426 and 780, 1931.

White, P. D., and Jones, T. D.: Heart disease and disorders in New England. Am. Heart J. 3: 302, 1928.

Williams, J. C.: Practical Observations on Nervous and Sympathetic Palpitation of the Heart, Particularly as Distinguished from Palpitation the Result of Organic Disease; to which are prefixed some general remarks on the Use of the Stethoscope and Employment of Percussion in Diagnosis of Diseases of the Heart and Lungs. London: Longman, Rees, Orme, Brown and Company. Pp. 2 and 65, 1836.

FRACTURE OF THE (NAVICULAR) CARPAL SCAPHOID

BY JOSEPH H. BURNETT, M.D.*

FRACTURES of the carpal scaphoids, while apt to be very crippling to the individual unfortunate enough to have sustained one, have up to comparatively recent times received very little attention from general practitioners, x-ray men and surgeons alike. Many of these wrists are treated either by the patient or by the doctor without an x-ray, erroneously, as sprains, until too late to be given the proper treatment. The writer believes that these cases are worthy of more consideration and brings to the attention of those interested in this work a method of treatment that is apparently working out well, with a view to stimulating others to use it.

The scaphoid is made up of closely meshed cancellous bone surrounded by a thin layer of cortical or compact bone covered with cartilage. Non-articulating surfaces are rough and knobbed for attachment of ligaments and tendons. Carpal bones, as a group, receive their blood supply from small terminal twigs derived from the ulnar and radial arteries. These arterioles enter the bones via ligamentous attachments, entering along the periosteum and spreading out in all directions[1].

The wrist joint as a whole, is a condyloid joint allowing all movements except rotation, i.e., extension, flexion, abduction (radial flexion) and adduction (ulnar flexion), with more of the latter because of the higher level of the ulnar styloid. The excursion of the scaphoid is the greatest of any bone in the carpus. Fractures and dislocations of the carpal bones occur about once in eight to ten times compared with fractures of the wrist, i.e., Colles and kindred fractures[1]. When involved in trauma the scaphoid is usually fractured and seldom dislocated, whereas the reverse is the usual story with the semilunar.

MECHANISM OF CARPAL FRACTURES AND DISLOCATIONS

These conditions are due either to direct or indirect violence. Direct violence is rare and is usually associated with a crushing of the soft parts. It may occur when the forearm and hand are at rest, i.e., back-fire of an auto when cranking, or it may occur and usually does when the hand and forearm are moving parts, i.e., falls on the hand. In falls forward the hand is generally in slight radial flexion, whereas in falls backward the hand is constantly in radial flexion. In strong radial flexion with the wrist extended to 90° or more, the scaphoid becomes wedged between the radius and the os magnum with a fracture resulting. This squeezes the

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spongy part of the bone and at once interferes with its blood supply. There is a tendency for the proximal portion of the bone to stay with the semilunar while the distal portion tries to go with the distal row of bones thereby causing the fracture most commonly seen, namely, across the central part. This same mechanism also causes fracture with dislocation of the fragment in severe cases[1].

With the fracture, faulty blood supply to the parts develops with the result that the scaphoid often dies and undergoes a slow aseptic necrosis. As this happens, it retains its original x-ray density, whereas the surrounding bones become lessened in density due to the loss of calcium salts in the atrophy of disuse. In the ununited fracture there is usually formed a central cavity possibly due to the destruction of the blood supply with cyst formation. (See case 1.)

In old cases as an end result, we can often expect the death of the bone, absorption with cavity formation and irritation to the surrounding parts from the remnants. The pathology gradually extends to the other parts with resulting loss of motion and pain on motion. From the distal end of the radius following along torn ligaments, new bone is thrown out and wrist stiffness results. Speed believes this stiffness is nature's reaction to the pain in the carpal joint (a sort of splinting effect). (See plate I.)

PLATE I.

Showing old fracture scaphoid with sclerosing of distal fragment and elongation of radial styloid.

The average case develops greatly restricted motion and with this is the interference with the tendons, causing loss of grip and atrophy of the forearm muscles[1].

SYMPTOMS

This is one condition that "runs true to form" inasmuch as most of the cases have almost identical complaints. Chief and foremost is pain at the site of fracture, disability and pain on pushing, limitation of dorsal flexion, local tenderness and a marked weakness of the wrist as a whole. Occasionally there is a poor grip but this is usually the exception.

PROGNOSIS

From a clinical standpoint the unrecognized or tardily recognized fracture offers a progressively poorer prognosis in direct ratio to the length of time since fracture[1]. Many, in fact most of these cases, are seen in the younger age groups and are most crippling, far more so than the average Colles' fracture poorly treated or untreated. A group of 37 cases reported by the writer in 1929 from the Out-Patient Department at the Boston City Hospital showed over 60 per cent to be thirty years of age or less[2]. If bone absorption, cavity formation and local irritation with new bone formation have started, it may be possible to check this by operating upon the scaphoid, i.e., either removing part or all of it or by the grafting operation. It has been clearly shown by experience that the removal of the scaphoid has not produced a satisfactory result in all cases hence the resort to the graft. The cases with old fractures, however, offer a poor prognosis. These old cases are often crippling, many of them giving a practically stiff wrist with chronic weakness and pain. In all fairness I think it can be said that some of the acute cases get well with a good result with or without treatment and that some of them do not do well regardless of the treatment. Many acute cases show a very fine fissure fracture often overlooked by physicians unfamiliar with them and which untreated show a heavy line of absorption within a very few months. The following case shows this condition plainly.

CASE 1. T. C., aged 34, laborer, injured his wrist May 20, 1932, lifting a roll of paper. Roentgen films showed a fissure fracture and the patient was treated with A and P splints for four to five weeks with

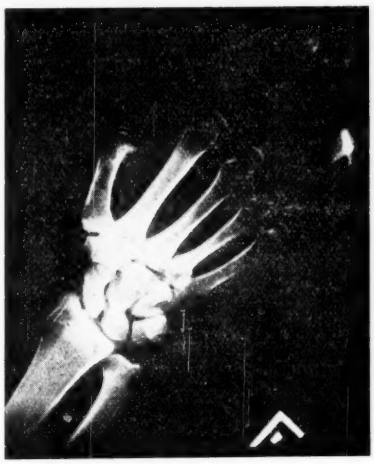

PLATE 1.

CASE 1. T. C.—May 20, 1932. Fissure fracture of scaphoid.

baking and massage. He was out of work practically four months. In July, 1933, he was reëxamined because of the condition of his wrist, namely, pain, weakness, inability to push or to dorsally flex wrist.

PLATE 2.

CASE 1. T. C.—July, 1933, showing line of absorption with ? of cavity formation.

The film taken at that time shows marked absorption almost to the extent of cavity formation. Operation was advised, but the patient was unable to make up his mind.

Recent fractures seen early and properly treated do rather well as a rule. Acute cases, properly treated, showing a poor result at the end of three to four months or more, should be operated upon at that time inasmuch as they will get progressively worse. In complicated cases with separation of the fragments, early removal should give a favorable result.

TREATMENT

Recent cases in good position are best treated by immobilization and rest, hoping for bony union. There is considerable difference of opinion as to just how the hand should be held at this time, many using the cock-up position and many others using the reverse, i.e., slight volar flexion with radial flexion. Many years ago while working with Dr. Cotton and Dr. Berlin, this phase was studied at length and the conclusion arrived at that the cock-up was preferable, this being particularly desirable in the event of stiffness of the wrist, the position of choice for an ankylosed wrist being in extension. Dr. David Berlin working on the cadaver has shown that the cock-up position gives better apposition[3]. Drs. Speed and Adams disagree with this, saying that dorsal flexion tends to pull the distal fragment back from the proximal fragment. In putting these cases at rest the plaster of Paris cast is used instead of the ordinary cock-up splint. This fixes the wrist, does not require adjustment when properly applied and insures the patient of a continuance of the treatment. Many times with the cock-up splint these patients give up the treatment at the end of two to three weeks and are never seen again. Immobilization regardless of how obtained should be maintained for at least six weeks, followed by baking and massage for a few weeks. Too much emphasis cannot be placed on the need of six weeks' immobilization, less time, in my opinion, being entirely inadequate. This is necessary to allow restoration of the blood supply and the healing of torn ligaments. The cast is applied in the cock-up position with slight radial flexion to include the palm of the hand and the base of the thumb, but does not limit the motion of the fingers. Following the removal of the cast a straight splint can be applied for a few days or a flannel bandage applied and motion started at once. Most of these cases seen within the 48° following trauma will do well under this routine. The mistake most people make is to shorten the period of absolute rest.

Cases with marked separation or comminution of fragments should be operated on at once removing part or all of the bone. Here again there is much difference of opinion as to what to do. Dr. Speed believes in removing the entire bone. Dr. Cotton believes it is better to leave in a part of the distal fragment, thinking that a more stable joint will result from so doing. The distal fragment has a much better blood supply than the proximal. Care should be taken to trim this fragment enough to prevent its contact with the radial styloid. There is also a difference of opinion as to whether this distal fragment will atrophy and undergo absorption.

The third group of cases now comes up for consideration and they represent the crippling ones that have had months of trial with the resultant pain and weakness so often seen. This group represents the cases treated or otherwise, and they are usually untreated or poorly treated, that have gone on to mal-union, cavity formation, bone formation along the radial styloid, to a definitely poor result. To men engaged in the heavy occupations requiring the use of the wrist continually, these cases make them practically totally disabled. Some time ago many of the industrial surgeons were consulted for their opinions regarding the end results of removing part or all of the scaphoid. While some favored total removal and others partial, all however agreed that the results were not too good and advised leaving the wrist alone if possible.

Dr. John Adams of Boston, so far as I know, was the first one to resort to the graft operation for these cases[4]. It was thought at first that this produced bony union; but time has proved that the union is fibrous in most cases. However, clinically this operation gives a good result in the few cases tried and should be used

more extensively. The remarkable thing about it is that the patients are satisfied and feel entirely relieved from their previous symptoms. In performing this operation, I have grafted a piece of the tibia; others make use of the radius on the same arm. Some men believe in the bone peg instead of the graft. The peg operation is much easier, but I think that it does not stabilize the parts so well as the graft.

DESCRIPTION OF OPERATION

Using a tourniquet and following the usual two-day bone preparation, an incision is made along the dorsolateral aspect of the wrist usually 1½″ to 2″ in length. Considerable help is derived from the radial styloid as a landmark and guide to locating the correct bone. (The semilunar has been removed by mistake.) Having opened the wrist joint, the wrist is then placed in acute palmar flexion with some radial flexion thereby placing most of the scaphoid bone in the middle of the wound. The line of fracture is usually easily seen and serves as an additional means of identifying the proper bone. The fractured surfaces are then curetted and a groove chiselled out on each side of the fracture in which the graft is to be placed. For this technique small dental chisels and hammer are used. The graft is then removed from the upper third of the tibia and trimmed to fit the mortise. This part of the operation requires considerable care inasmuch as the graft must be placed securely and driven in at each end so as to be level with the surface of the surrounding bone. The graft when so placed is usually about 1½ cm. in length and about 3 mm. wide and 3 mm. thick. When properly placed, as many bone chips as possible are then put in the fracture line at either side. Care must be taken lest by packing these in too tight the graft be dislodged. The wound is then sutured in the usual manner. Following the operation the wrist is put up in plaster as above, i.e., dorsal flexion with slight radial flexion. This is kept on for six weeks to be followed by a straight splint for ten days, meanwhile instituting baking and massage.

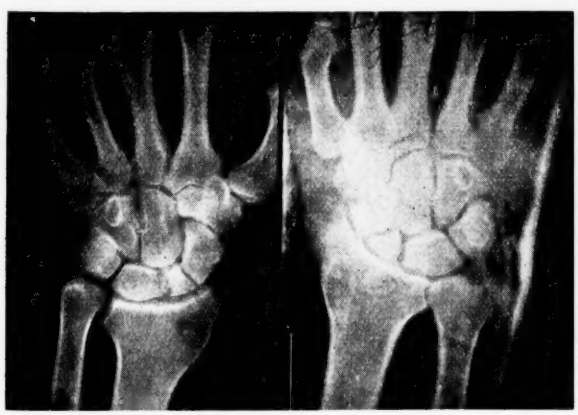

PLATE 1.

CASE 2. D. A. L.—April 7, 1930. CASE 2. D. A. L.—April 10, 1930.

CASE 2. D. A. L., chauffeur-mechanic, aged 47, fell, in August, 1929, injuring his wrist. He wore a leather splint for two months without relief. In February, 1930, he was at the hospital because of pain, weakness and inability to push. Graft operation April, 1930. In plaster cast for ten weeks. Plate 1 shows the case before operation and immediately following operation; plate 2 a year later, showing presumably fibrous union, a clinically excellent result.

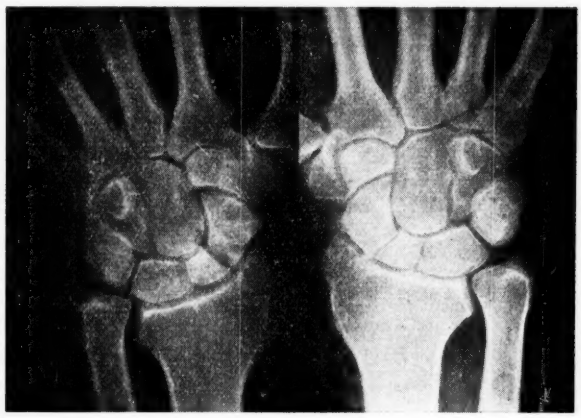

PLATE 2.

CASE 2. D. A. L.—June 3, 1931. CASE 2. D. A. L.—March 10, 1931.

CASE 3. P. O., student, aged 17, injured his wrist in November, 1931, playing football. He had little or no treatment. Peg operation July, 1932, plaster cast eight weeks. Plate 1 shows case before and after operation. Plate 2 shows case four months later. Excellent result clinically.

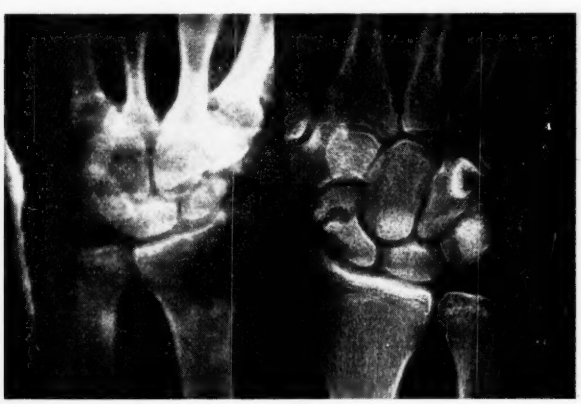

PLATE 1.

CASE 3. P. O.—July 26, 1932. CASE 3. P. O.—May 24, 1932.

PLATE 2.
CASE 3. P. O.—November 19, 1932.

CASE 4. N. Y., student, aged 17, injured his wrist in December, 1930, and injured it again recently. December, 1932, graft operation, plaster cast six weeks, anterior splint ten days. This boy also had an ununited fracture of the styloid of the ulnar. Plate 1 shows wrist before and immediately after operation. Plate 2 shows wrist two months later.

PLATE 1.
CASE 4. N. Y.—December 20, 1932. CASE 4. N. Y.—December 10, 1932.

Plate 3 shows wrist nine months later. From an x-ray point of view this one appeared to show bony union. Clinically the boy is extremely happy over the result.

At first the x-rays on these cases show what appears to be bony union, but as a rule this bony union changes to one of fibrous union at the end of some months, judging from experience with a few cases. Case 4, however, at the end of nine months shows what appears to be straight bony union.

SUMMARY

Results on the cases reported to date are much more satisfactory than those operated on by any other method. They require more time for convalescence but the anatomy is undisturbed and the patients themselves feel very much satisfied. They are entirely relieved of their symptoms. Believing that the usual procedure of removing part or all of the scaphoid has not given sufficiently satisfactory results to warrant its routine continuance, another operation is brought to the attention of those working in this field. I believe that this graft operation is easily performed, does not change the anatomy of the wrist and does give excellent results.

I am grateful to Dr. F. J. Cotton for his stimulating influence and his coöperation. I am also grateful to Dr. John Adams for his help in this work and to Dr. David Berlin for his timely coöperation in the early part of this work.

PLATE 2.
CASE 4. N. Y.—February, 1933.

PLATE 3.
CASE 4. N. Y.—September 2, 1933.

REFERENCES

1 Speed, Kellogg: Traumatic Injuries of the Carpus. 1925.
2 Burnett, Joseph H.: Fractures of the carpal scaphoid. New Eng. J. Med. 200: 126 (January 17) 1929.
3 Berlin, David: Position in the treatment of fracture of the carpal scaphoid. New Eng. J. Med. 201: 574 (September 19) 1929.
4 Adams, John D., and Leonard, Ralph D.: Fracture of the carpal scaphoid. New Eng. J. Med. 198: 401 (April 12) 1928.

VERMONT STATE MEDICAL SOCIETY

HEART DISEASE*

BY LEWIS M. HURXTHAL, M.D.†

Mr. President and Members of the Vermont State Medical Society, Ladies and Gentlemen:

WHEN congestive heart failure develops in the patient with heart disease, I think you will all agree that the prognosis is usually considered to be poor. This pessimistic attitude is in many cases entirely unwarranted. With careful attention to detail and continued effort on the part of the physician, an unexpected number of these cases may be put back on their feet and with the control of their activities and the relief of burdens, such as overweight, some will have a surprising number of years of fairly normal activity.

Many patients with congestive heart failure do not get better because of the fact that even though the heart may become compensated, edema is not reduced. A vicious circle is set up and until the edema has been cleared up, the heart cannot perform at its best. In recent years the mercurial diuretics have been developed so that we now have a diuretic which approaches the ideal. It is usually non-toxic, can be given in various ways, and furthermore, it is usually effective. This diuretic is known as salyrgan. It is important, I think, to stress the use of salyrgan because, if other diuretics are not effective, this will almost always be of some benefit. There are practically no contraindications to its use in congestive heart failure except the presence of chronic kidney disease with nitrogen retention. It may be dangerous, however, if great care is not used in its administration. The drug is administered either intravenously or intramuscularly, never subcutaneously. If given intravenously, great care should be taken that every drop of the solution enters the vein and that none works its way into the subcutaneous tissue around the vein. If this happens, a marked local reaction may take place and even sloughing. It is best to combine salyrgan with five or ten cc. of normal saline solution when giving it intravenously. By so doing, the chance of venous thrombosis is reduced and should some work its way out of the vein, the local reaction will be less severe. The drug works almost as well intramuscularly as it does intravenously and we have found it advantageous to dilute salyrgan with a small amount of normal saline and one or two cc. of one per cent of novocaine solution. Here again, care should be taken that the drug is given intramuscularly and then that none finds its way into the subcutaneous or fatty tissue. The usual initial dose of salyrgan is one cc. If this is effective, the same amount may be given again in three or four days. If not effective, it is well to increase the dose by one-half of one cc. If no results are obtained by administering two cc. of salyrgan, it is probably unwise to give a larger dose.

The effect of salyrgan is enhanced by the combined use of ammonium nitrate. This chemical may be administered in capsules or in solution. A twenty-five per cent solution of ammonium nitrate flavored with peppermint is well tolerated by the patient although at times it produces some distress. An adequate dose is necessary and an attempt should be made to administer from eighty to one hundred and twenty grains per day. If it is well tolerated, it may be given indefinitely. Restriction of total fluid intake and also of sodium chloride should be carried out. At present there are satisfactory salt substitutes available in which the sodium ion is not present.

Salyrgan, of course, need not be given if digitalis has been effective. The adequate administration of digitalis is important if effective therapy is to be obtained. A good rule of thumb is to administer one grain and a half pill of digitalis leaf for each ten pounds, of body weight within twenty-four to forty-eight hours if rapid digitalization is desired. The same rule applies if digitalization is to be carried out over a longer period such as a week except that about twenty-five per cent more should be added to the calculated dose, in order to allow for excretion. If the estimated dose can be tolerated without toxic symptoms, and a therapeutic effect has not been obtained, it is well to continue a dose of three to four grains a day until the desired result has been obtained. The best clinical guide as to its effect on the heart rate is the slowing produced in auricular fibrillation. A reduction in the apex rate from above 100 beats per minute to a rate of from sixty to eighty comes about only when adequate dosage has been obtained.

I should like to say a word here about the cat unit which is now appearing on certain preparations of digitalis. The cat unit is roughly equivalent to the potency of the widely used grain and one half pill, or to one cc. of standard tincture of digitalis. The introduction of the cat unit as a standard unit of digitalis at this time when the grain and a half pill has become widely and intelligently used has only added to the confusion which has so long existed in the field of digitalis therapy.

*Read at the Annual Meeting of the Vermont State Medical Society held in Barre, October 5 and 6, 1933.

†Hurxthal, Lewis M.—Senior Physician, Medical Department, Lahey Clinic. For record and address of author see "This Week's Issue," page 89.

Absorption of digitalis from the gastro-intestinal tract may fail to take place at times. While not a frequent occurrence, nevertheless it is an important one and should be kept in mind when toxic symptoms or clinical results do not make their appearance. A recent case will serve to illustrate this point as well as the method by which it was successfully combated. A young man, who had had rheumatic fever some years before, entered the hospital with congestive heart failure. Examination revealed a right hydrothorax, an enlarged liver, massive edema of the legs and abdominal wall. The heart was moderately enlarged, with a loud systolic murmur at the apex, the rhythm was totally irregular with an apex rate of 140 beats per minute. Digitalis had been administered in what seemed adequate dosage before admission. During the first week, the patient received approximately thirty-one and a half grains of digitalis powdered leaf without change in weight or rate of apex beat. An electrocardiographic tracing was obtained which showed no evidence of digitalis effect on the T waves. Digitalis in the form of digalen was then administered intravenously, six ampoules each day for two days. Following this the apex rate slowed down to around eighty beats per minute. Some weight was lost but there was still edema present. Ammonium nitrate was then given for a few days, following which one cc. of salyrgan was injected intravenously. A prompt diuresis occurred yet it required the injection of one and one-half cc. a few days later to entirely eliminate the edema.

It was thought that perhaps digitalis had not been absorbed on account of congestive heart failure but subsequent events have shown this not to be the case. The patient was discharged on a grain and a half pill and in the ensuing week or two, the apex rate gradually returned to 140 per minute. This lad has actually taken as high as six grains of powdered leaf daily for a week without the slightest effect on the apex rate. Tincture, digitalin, and other preparations of dried leaf have been given with the same results. An intravenous injection, however, has been successful in reducing the apex rate again to a rate below ninety. There has been no return of congestion during all this and the patient, while not working, is up and around and free from symptoms.

The presence of fever or hyperthyroidism may make it difficult to slow the fibrillating heart with digitalis. Thus in the absence of fever, if a satisfactory response is not obtained with adequate dosage, suspect hyperthyroidism or non-absorption.

The dramatic effect of subtotal thyroidectomy in patients with congestive heart failure resulting from hyperthyroidism is a relatively recent advance in the treatment of heart disease. This can be best realized when we consider that only about ten years ago surgeons were afraid to operate on these patients. If every case of auricular fibrillation were suspected of hyperthyroidism, a good many cases now considered hopeless could be saved. Over eighty-five per cent of cases with congestive heart failure resulting from hyperthyroidism, have auricular fibrillation, and a good portion of these have other heart disease as well. With the beneficial effects of surgery in these cases well-established, future progress lies in recognition of underlying hyperthyroidism.

Recently total removal of the thyroid gland in cases of congestive heart failure and angina pectoris without thyroid disease has been advocated by Drs. Levine and Blumgart, and others in Boston. The rationale of this method or treatment is this: Under normal thyroid conditions, the diseased heart is not capable of meeting normal metabolic demands. Produce myxedema and low metabolism and the heart will be able to care for this lowered state of existence. Total removal is advised otherwise the thyroid remnants will regenerate and the normal metabolism again return.

This method of treatment is still in the experimental stage. Great care should be used in the selection of cases, and careful consideration should be given as to the advisability of producing myxedema. In my experience with myxedema, there is nothing more tragic than to see a patient with myxedema who cannot be brought to a comfortable existence from the thyroid point of view without producing angina. If he takes enough thyroid to feel at all well, he suffers from angina, if he reduces the thyroid so as not to produce angina he complains of myxedema. It is true that a certain number of people with myxedema do not seem to mind it, but that is because they are myxedematous and not normal individuals. Furthermore it must not be forgotten that congestive heart failure itself may result from myxedema. From the surgical point of view the risk of tetany in total removal of the thyroid is increased. All these aspects of this procedure have to be worked out. Only in this way is progress made.

Recent advances have been made in the treatment of peripheral vascular disease. Foreign protein injection and sympathectomy have proved their worth in peripheral disease of the Raynaud's or Buerger's type. The vasomotor index of Brown gives a reliable guide as to the probable benefits to be derived by lumbar or cervical sympathectomy. The vasomotor index is estimated from the amount of vasodilation as indicated by skin temperature readings after the injection of foreign protein or spinal anesthesia. In our experience it has been extremely valuable in early or threatened gangrene, less so in claudication.

It was my intention to show you at this time a film on the mechanism of the heart

beat and electrocardiography but because the room cannot be darkened, it would be useless to do so. I will show it on the stage at the end of this meeting for those of you who care to view it.

MISCELLANY

WINDHAM COUNTY MEDICAL SOCIETY

The Windham County Medical Society held a regular meeting on June 13, 1934, at the Brattleboro Country Club. Seventeen members were present and two guests. A luncheon was served at 12:30 preceding our regular meeting.

President W. H. Lane of Brattleboro called the meeting to order at 2 P.M. Following the reading of the minutes of the annual meeting by the Secretary, Dr. A. C. Black of Brattleboro gave a preliminary report of the committee of which he is Chairman, concerning the steps already taken in forming a Medical Credit Bureau for the County.

Following a short talk by the treasurer concerning delinquency in the payment of dues, there was some discussion which ended in the Society's voting to drop three members for non-payment of dues as follows: Dr. L. H. Bugbee of Putney, Dr. A. C. Liston of Bellows Falls and Dr. O. R. Hefflon of Jamaica.

Following some discussion it was regularly voted that the Society enter a protest with the State Medical Society because of the fact that under our income law physicians are not permitted an exemption for medical journals and office periodicals. The consensus was that such exemption should be allowed as we feel that medical journals and other office periodicals are just as important to our business as medical supplies and equipment.

After some discussion it was regularly voted on motion of Dr. Black of Brattleboro, that the Windham County Medical Society attempt to interest the State Medical Society in obtaining for the members of the county society the benefits of the Harkness Funds in enabling them to take postgraduate work.

Dr. G. R. Eades of Keene, N. H., was the speaker. His subject was "Acute Otitis Media." He discussed the various types of Acute Otitis Media, suppurative and non-suppurative and showed the points of differentiation of the two. He discussed the treatment for each and warned of the use of some of the methods in treating this condition. He stressed particularly the harmful effects of oily sprays for the nose and of the use of phenolglycerine drops in the ear in suppurative otitis. He advised against the use of irrigations in the suppurative otitis media where the drum had been opened or had perforated. At the close of Dr. Eades' talk, he was regularly accorded honorary membership in the society.

The meeting was adjourned on motion at 3 P.M.

VERMONT DEPARTMENT OF PUBLIC HEALTH

MAY, 1934

The incidence of communicable diseases reported to this department during the month of June is as follows: chicken pox 153, measles 248, mumps 29, scarlet fever 70, typhoid fever 19, undulant fever 1, tuberculosis 10 and whooping cough 106.

The Laboratory of Hygiene made a total of 1,892 examinations in May classified in the following manner:

Examinations for diphtheria bacilli	40
" " Widal reaction of typhoid fever	51
" " undulant fever	35
" " gonococci in pus	84
" " tubercle bacilli	205
" " syphilis	484
" of water, chemical and bacteriological	128
" " water, bacteriological	309
" " milk, market	271
" " milk, submitted for chemical only	6
" " milk, submitted for microscopical only	146
" " foods	5
" " drugs	6
" for courts, autopsies	3
" " courts, miscellaneous	35
" of animal heads for evidence of rabies	2
" for evidence of malaria	0
" Miscellaneous	80
Autopsies to complete death returns	2

Twenty new cases of gonorrhea and nineteen new cases of syphilis were reported to the Division of Communicable Diseases. This division distributed during the month 436 Wassermann outfits and 174 gonorrheal slides.

Eighty-four patients were visited by the nurses of the Poliomyelitis After-Care Division, eighty-three in their homes and one at the Burlington office. Five doctors were consulted, eight social service calls made, one cast removed, three patients admitted and two patients discharged from the Children's Hospital in Boston. Two patients were discharged from the Audubon Hospital and one patient from the Massachusetts General Hospital. Ten new pieces of apparatus were fitted, ten pieces of apparatus altered and twenty-six orthopedic corrections made to shoes. The Vocational Worker reports sales amounting to $66.53 for the month.

The State Advisory Nurse of the Division of Maternity and Infancy visited Mothers' Clubs assisting in their programs, talked at several P. T. A. meetings on the Summer Round-Up Campaign, attended one public conference and attended the meeting of the Federated Women's Clubs. One hundred and thirteen notifications of birth certificates and four hundred and fifty-two pieces of literature were mailed.

WINDSOR COUNTY MEDICAL SOCIETY

Windsor County Medical Society held its Annual Meeting at Windsor Hospital, Windsor, Vermont, on May 17, 1934.

The business session was called at 12:30 P.M.

Alan E. Smith of Chester, Vermont, and Samuel H. McKewen of Windsor were elected to membership.

George Roberts of Chester, H. B. Denman of Springfield, and V. M. Rogers of Queechee died during the year.

The following new officers were elected:

President: A. C. Walker, Springfield.

Vice-President: T. F. Gartland, White River Junction.

Secretary and Treasurer: A. L. Patch, Windsor.

Delegates to the Vermont State Medical Society: A. M. Cram (2 years), Bridgewater; A. L. Patch (1 year), Windsor.

At 1 P.M. luncheon was served in the dining room to which sixteen sat down.

At 2 P. M. Dr. Clarence A. Bonner of Danvers State Hospital, Danvers, Massachusetts, delivered an address on "Modern Trends in the Treatment of the Insane." He was followed by Dr. T. J. Allen of Brandon, Vermont, who presented a demonstration of a complete neurological examination. Owing to the lateness of the hour the paper by Dr. Wm. H. Krause of Windsor was omitted and the time spent with Dr. Allen in discussion of his demonstration.

Eleven members were present at the meeting.

NORTHEASTERN COUNTY MEDICAL SOCIETY

The Northeastern County Medical Society had its third quarterly meeting at Hotel Barton, Barton, Vermont, May 9, 1934. There were thirty-three members present. A delicious dinner was served at 6:30 P.M. and the meeting was called to order directly after the repast.

The minutes of the last meeting were read by the secretary, Edward A. Cramton, and approved.

The names of Drs. F. L. Lanphear of Orleans, W. H. McBride of Island Pond, Winston Arthur Sargent of Newport, C. B. Foster of Greensboro, F. L. Kinney of Hardwick, and R. R. Cartier of St. Johnsbury came up for election to the society. Their names had been approved by the censors Fitch, Cleasby and Leonard and they were unanimously voted into membership of the society.

It was unanimously voted that we meet in July at the Newport Country Club.

Dr. Frasier B. Gurd of Montreal General Hospital next delivered a talk on "Rectal Conditions as Met by the General Practitioner." Particular emphasis was placed upon the proper examination of patients who present themselves with rectal complaints, especially bleeding. He said one should never prescribe ointments or suppositories until the finger has been inserted into the rectum. The frequent occurrence of malignancy in this region makes this an absolute necessity if we are to detect early malignancy and procure satisfactory cures. Digital examination will reveal 90 per cent of the cases of malignancy in the rectum as most of the lesions lie close to the anus and rarely extend above the rectosigmoid junction. Thorough examination in suitable cases includes proctoscopic examination. This procedure, he said, should be carried on in the hospital rather than in the physician's office. He said the anoscope was a very valuable office instrument.

The various rectal lesions were then taken up. Ischiorectal abscesses are most often due to ulcers in the rectal wall, or fistulas. Only ten or twelve per cent are tuberculous. He advocated a radial incision, with the removal of a triangular area of skin with the apex toward the rectum. He packed these cases with a preparation called "vipt," which is bismuth two parts, iodoform one part, paraffin paste one part. The packing is firmly placed and the incision closed, the packing to be removed four to ten days later. The wound is then treated with "vipt," or covered with this paste and allowed to heal. Healing is usually fairly prompt.

Fistula in Ano. He gives these cases three months before attempting radical interference. He always makes a practice of injecting methylene blue so that the fistula may be more easily followed. A triangular portion of skin is generously excised with the point in the anus, and the tract of the fistula is removed. He packs these wounds with "vipt" and uses similar treatment as in ischiorectal abscesses.

Internal Hemorrhoids. Each physician, according to Dr. Gurd, develops an individual technique for the removal of internal hemorrhoids. His method of choice is the clamp and cautery without suture. Dr. Gurd went into considerable detail about the injection method of treatment, and said that there were some good men enthusiastic about the results following this practice. At the Montreal General Hospital hemorrhoids are practically never injected. In cases in which hemorrhoidectomy is done under local anesthesia, Dr. Gurd wished to caution against vigorous stretching of the sphincter which in these cases is paralyzed. It is very easy to tear a paralyzed sphincter and produce permanent paralysis of that muscle with incontinence. He therefore prefers other types of anesthesia to local.

Fissure in Ano. This is a very painful condition which may be given relief and cured in most cases by simple dilatation of the rectum, which causes temporary paralysis. Excision of the fissure is necessary in some cases.

Prolapse of the Rectum. This is a common condition in children and its cure necessitates only proper handling of the child at stool. Advise mothers not to let the child strain at stool when they cannot accomplish defecation, as constant straining when the rectum is empty causes prolapse.

Prolapse in Adults. This is a serious condition. Dr. Gabriel advocates injection in the submucosal tissue. One case he treated recently in Montreal has turned out very successfully. None of the useful operations are simple. Amputation of the rectum should not be carried out.

Granuloma Inguinalis. This infection caused by a virus has been proved to infect the rectum. Diagnosis is made by the Frei test. All strictures of the rectum are probably caused by this infection. Tartar emetic is effective in treating this disease in the acute stage.

Carcinoma of the Rectum. Early treatment of this condition gives excellent results, because metastasis occurs relatively late. Clinical signs at a hopeful period are meagre. Carcinoma occurs at an earlier age in the rectum than in other parts of the body. It is not uncommon in individuals of 20, and is most common after 40. Any bleeding from the rectum which cannot be accounted for satisfactorily makes thorough examination, to rule out carcinoma, necessary.

Dr. Gurd then passed around colored molds illustrating various types of carcinoma of the rectum. Lantern slides were shown to illustrate the microscopic anatomy of these lesions.

A rising vote of thanks was given to Dr. Gurd.

The meeting adjourned at 10:45 P.M.

RECENT DEATHS

ARCHAMBAULT—J. A. Archambault, M.D., of Essex Junction, Vt., was born in Enosburg Falls in 1874 and died suddenly on May 31 at his home, after a heart attack.

He attended the public schools in Enosburg Falls. After graduation from the College of Medicine of the University of Vermont in 1901, he took a post-graduate course at Cornell University and then taught chemistry in the University of Vermont for fourteen years.

In 1906 he became associated in the practice of medicine with the late Dr. C. M. Ferrin in Essex Junction. Dr. Archambault was an unusually keen business man and known for his many deeds of kindness and charity during his thirty-three years as a successful physician in the community.

He is survived by his wife and one son, Mark, a student at the University of Vermont Medical College.

WINSHIP—E. Oliver Winship, M.D., aged 58, a native of Danby, Vt., and a physician for thirty-three years, died at his home in New London, Conn., June 1, 1934.

A graduate of the University of Vermont Medical School in the class of 1900, Dr. Winship first practiced in Rockville. He went to New London twenty-three years ago to specialize in the treatment of eye and ear cases.

He was widely known throughout the state, both in medical and fraternal circles.

Surviving are his widow and two daughters.

A STUDY OF ONE HUNDRED AND SEVEN CASES OF EARLY SYPHILIS*

BY FRANCIS THURMON, M.D.,† AND LEO KORETSKY, M.D.†

In spite of the great desirability for a universal standardized method of treating syphilis, the therapeutic procedures in use at the present time remain as numerous and varied as do the physicians and clinics purporting to treat this important affection. A partial justification for this therapeutic variation lies in the fact that the clinical course of treated syphilis varies. In many cases, as few as eight or ten injections of an arsphenamine plus an equal number of bismuth or mercury appear to effect a complete recovery; while in others, even forty or more injections of each of these drugs do not prevent clinical and serologic relapses. Moreover, a few patients are so intolerant of the arsphenamines that these preparations are of necessity omitted, and the patients, instead of being treated by "routine methods" become individual problems.

Eighty per cent of all cases of primary and secondary syphilis occur in robust young males and females who present no idiosyncrasy to the various arsenical drugs. The fact that a planned treatment for this group will effect complete recovery in eighty to ninety per cent of the cases makes individual specialization for them unnecessary. For those who experience untoward reactions there are no absolute criteria to serve as a guide in treating the individual case except intolerance for the drugs used; therefore, for this type of patient, recourse must be taken to experience which indicates the type and minimum treatment necessary to effect recovery in the greatest percentage of cases. For this latter group and for them alone is individual specialization necessary, while for the others a uniform standard treatment will suffice.

Illustrative of the above considerations is this study of 107 cases of primary and secondary syphilis. The results of an intensive "planned treatment" that has been in use at the Boston Dispensary for several years are presented. The observation and treatment period for each patient has ranged between two and four years.

OUTLINE OF TREATMENT

An outline of the intensive planned treatment referred to above is as follows: Immediately after the diagnosis of primary or secondary syphilis has been confirmed by laboratory procedures the patients are started on arsphenamine*, each case receiving three injections a week for the first two weeks, two injections a week for the second two weeks, and one injection a week for the succeeding two weeks, so that at the end of the first six weeks of the treatment period each case has received twelve injections of an arsenical preparation. Then, without an intervening rest period, intramuscular therapy is instituted, each patient receiving an injection of bismuth salicylate (0.130 Gm.) at seven-day intervals for a total of twelve in-

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*The dosage of arsphenamine ranged from 0.2 to 0.4 Gram; of neoarsphenamine from 0.3 to 0.6 Gram; of silver arsphenamine 0.1 to 0.3 Gram; of bismarsen 0.1 to 0.2 Gram.

jections. This is considered to constitute one complete course of treatment. Regardless of the patient's serologic reactions and provided the clinical progress has remained uneventful, treatment is continued until two additional complete courses have been administered. With regular attendance this period of continuous medication covers the first sixty-six weeks of observation during which time the patient has received thirty-six injections each of an arsenical preparation and of bismuth. These seventy-two injections are regarded as the minimum amount of therapy any case with primary or secondary syphilis should receive.

At the end of this period, should the patient be without symptoms and his blood Hinton, Wassermann, and Kahn tests have been persistently negative for at least the last six months of treatment, that case is regarded as being a "potential clinical recovery" and further treatment is unnecessary. If in addition to the above criteria, the cerebrospinal fluid has been examined and found to be normal any time after the first year of treatment, that case is considered to be a "potential complete recovery."

In the event that any of the three blood tests remain positive at the end of three complete courses, treatment is continued. Any patient receiving continuous treatment for two years or longer, who is clinically asymptomatic but whose serology remains positive, is considered to be a case of tertiary syphilis until the cerebrospinal fluid has been examined and found to be normal; then the latter being true, that case is placed in the sero-resistant group. Should the cerebrospinal fluid be positive the patient is obviously one of neurosyphilis.

All cases showing a "potential" clinical or complete recovery are placed on observation without medication and are requested to return at three-months' intervals for the first year following the end of treatment, at six-months' intervals through the second year, and annually thereafter for as long as the cases can be urged to report. At each of these visits, physical, serologic and urine examinations are done, and should all be normal and remain normal beyond the first year following the end of treatment, that case is considered to have made either a clinical or complete recovery, accordingly as defined above.

DATA

Primary Syphilis:—

There were forty-two cases of primary syphilis, thirty-eight of whom received the continuous routine treatment previously outlined. The results are summarized in table 1. Four cases received interrupted treatment because of irregular attendance. The data show a 92.1 per cent clinical recovery for any case of primary syphilis starting treatment during the first four weeks of the chancre stage.

TABLE 1

RESULTS OF TREATMENT OF PRIMARY AND SECONDARY SYPHILIS IN EIGHTY-NINE PATIENTS WITH REGULAR ATTENDANCE

Stage of Syphilis	Number of Cases	Clinical Recovery Cases	Clinical Recovery Per Cent	Complete Recovery* Cases	Complete Recovery* Per Cent	Serofast Cases	Serofast Per Cent	Tertiary Syphilis Cases	Tertiary Syphilis Per Cent	Secondary Recurrent Syphilis	Average Observation Period
Primary Syphilis treatment started previous to fifth week of duration of chancre	38	35	92.1	21	55.3	3	7.9	0	0	0	31 months
Secondary Syphilis treatment started previous to seventh week of duration of rash	33	26	78.7	14	42.4	2	6	5	15.1	0	35 months
Secondary Syphilis treatment started after sixth week of duration of rash	18	6	33.3	4	22.2	4	22.2	8	44.4	1 case	34 months

*The statistics of this column are misleadingly low, due to our inability to perform lumbar puncture on a greater number of patients.

Too great reliance cannot be placed upon the statistics of the complete recovery column since the figures here undoubtedly would have been higher had more patients submitted to lumbar puncture. This much can be said with certainty, that 55.3 per cent represents the minimum percentage of complete recovery to be expected in patients starting treatment during the first four weeks of the primary stage.

Three of the thirty-eight cases receiving routine treatment became serofast, but no case developed recurrent or tertiary lesions.

Much has been published in the literature relative to the value of starting treatment in the seronegative stage. With this in view, the thirty-eight cases of primary syphilis were tabulated with special reference to serology at the time of admission. The serology was recorded positive when any of the three tests (Wassermann, Hinton, Kahn) were positive at the time treatment was started. The results are summarized in table 2; they show a 100 per cent clinical recovery for thirteen seronegative cases, and an 88 per cent clinical recovery for the twenty-five cases that were seropositive at the time treatment was instituted. The three serofast cases come from the seropositive group; the significance of this observation is subject to interpretation, that is to say, these three patients were unable to tolerate routine therapy, which fact necessitated either a reduction in dosage or a variation in the type of therapy used.

TABLE 2

THE RESULTS OF TREATMENT IN SERONEGATIVE AND SEROPOSITIVE PRIMARY SYPHILIS WITH REGULAR ATTENDANCE

Serology on Admission	Number of Cases	Clinical Recoveries		Complete Recoveries		Serofast	
		Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Negative	13	13	100	10	77	0	0
Positive	25	22	88	11	44	3	12

Secondary Syphilis:

Of the sixty-five cases of secondary syphilis, fifty-one received continuous routine treatment. The results are summarized in table 1. In fourteen cases, treatment was irregular because of poor attendance.

The division of the secondary cases according to the duration of that stage of the disease rather than the duration of the infection was necessary because in many of the female patients the secondary eruption was the first known evidence of the infection.

Of the thirty-three patients starting treatment during the first six weeks of the secondary stage, twenty-six or 78.7 per cent, showed a clinical recovery, five developed tertiary manifestations, and two became serofast. No case developed a recurrence.

Of the eighteen patients starting treatment after six weeks' duration of the secondary rash, six or 33.3 per cent, showed a clinical recovery, eight were classified as tertiary, and four became serofast. One patient developed secondary recurrent lesions. This patient, admitted with a periostitis and florid eruption, developed a recurrent rash at ten months and eventually became serofast.

Of the thirteen cases classified as having tertiary syphilis only two patients had clinical manifestations of the same, but the remaining eleven were so grouped even though they were clinically asymptomatic, because their serology was positive and a cerebrospinal fluid examination had not been done.

As a point of considerable interest it should be mentioned that one of the patients with clinical symptoms of tertiary syphilis had a positive cerebrospinal fluid for twenty-two months but persistently negative serology from the third through the twenty-seventh month of his infection.

Irregularly Treated Cases:

Four patients with primary syphilis had irregular treatment. The duration of the primary lesion was one, one, five and seven weeks respectively, the average observation period being thirty-two months. In three cases the serology remained positive at the end of observation, though clinically they were asymptomatic. The fourth patient never had a positive blood test, the diagnosis having been established by dark-field examination. This case had a questionable recurrent primary at twenty-four months and developed an iritis at thirty-one months; the cerebrospinal fluid and neurological examinations were normal during the third year of observation.

Fourteen patients with secondary syphilis were irregular in attendance. Their average period of observation was thirty-three months. Of these, three made clinical recoveries; three became serofast; two developed neurosyphilis, and six remained serologically positive but clinically asymptomatic. In this group there were two secondary recurrences and two serolapses.

DRUGS AND COMPLICATIONS

Routine intensive therapy implies the use of arsphenamine and bismuth. Frequently untoward reactions to these drugs necessitated a departure from the plan of treatment outlined above. In such cases, when the offending drug was arsphenamine, neoarsphenamine was used, and when reactions to the latter occurred, sil-

ver arsphenamine was given. Should a patient be intolerant of all three of these arsphenamines, bismarsen would become the drug of choice. Whenever bismuth was found to be inadequate or was contraindicated because of untoward reactions, mercury succinimide or salicylate was substituted.

At one time or another during treatment 56 per cent of these 107 cases manifested untoward reactions of varying types and severity to the drugs used. Of these reactions* 41 per cent were of a mild nitritoid variety and five per cent were severe. Nine per cent had definite arsphenamine hepatitis with icterus; five per cent had dermatitis; and there was one case each of purpura, papilledema, and peripheral neuritis, due to arsenical intoxication.

Twenty per cent of the cases manifested toxic reactions to bismuth. These were characterized by severe local pain, blue line or pain in the gums, and diarrhea.

One patient had a severe nitritoid reaction to bismarsen.

CONCLUSIONS

1. An intensive treatment régime for early syphilis has been outlined and the results of its application evaluated in a study of 107 cases of primary and secondary syphilis.
2. A comparison of the results obtained in the treatment of seronegative and seropositive primary syphilis shows a decided (though perhaps slight) advantage in starting treatment during the seronegative stage.
3. Hence, in order to make an early diagnosis it becomes highly important to do repeated dark-field examinations in all suspected cases rather than wait for a positive serological report.
4. The later treatment is started, the lower is the percentage of clinical recoveries.
5. The incidence of serum fast cases rises considerably in cases starting treatment after six weeks' duration of the secondary stage. Singularly, the incidence of serum fastness in cases starting treatment in the first six weeks of the secondary stage is slightly lower than its average incidence for the primary cases. This gives rise to the question: Do patients develop an immunological resistance when allowed to go untreated into the secondary stage?
6. Since all the clinically asymptomatic but serologically positive cases of primary syphilis with regular attendance had lumbar punctures the serofast column (7.9 per cent) in this group is reliable. It is believed that had more lumbar punctures been done among the primary irregular and all the secondary cases, the figures of the tertiary syphilis column (25 per cent of 51 cases) would undoubtedly have been lower, and those of the serofast column (eight per cent of 107 cases) would have been higher.
7. The number of secondary recurrences is just about nil (one case) with the planned intensive treatment.
8. The frequency of untoward reactions to the drugs used was high, but not sufficiently frequent to merit discontinuing the intensive planned treatment.
9. The advantage of early recognition and regular intensive treatment of primary and secondary syphilis is apparent.

*It may readily be seen that a single case was capable of experiencing more than one type of reaction, i.e., nitritoid, dermatitis, gingivitis.

MEDICAL PROGRESS

THE PROGRESS OF NUTRITION

BY FRANCIS LOWELL BURNETT, M.D.*

ALIMENTATION, INTESTINAL RATES, AND CELL REGENERATION

THE science of nutrition, which I shall designate as alimentation, has become slowed and investigators tend to abandon it as a sterile field. Alimentation "is intended to include the sum total of the several processes that occur in the different regions of the digestive tract. Here ingested food materials are subjected to the varied environments furnished by the alimentary secretions—the saliva, gastric, pancreatic, and intestinal juices and bile. In the contents of the gastro-intestinal canal a diversity of enzymes promotes a succession of chemical changes of outstanding importance, for the nutritive functions of the body. . . ." Formerly the "highly important function—secretion, digestion, absorption, to which may be added the alimentary movements—were among the dominant topics of physiological and biochemical investigation . . . this research interest has waned. Shall we conclude that the details of the fate of our foods in alimentation have been fully discovered? . . . Consider . . . the fate of ingested fats. . . . The mechanism of absorption of fat is now understood . . . to some extent; . . . and depends on the reaction of the intestinal contents, on the formation of hydrotrophic substances and on the action of these . . . in altering the permeability of the epithelial cells . . . the precise way in which the fat is transferred from the intestinal mucosa into the depots and from there to other tissues in accordance with metabolic

*Burnett, Francis L.—Director of Health Class for Psoriasis, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 89.

requirements is almost unknown." (Mendel, L. B., *Science*, 78:317, 1933.) "Since the digestive tube is an enfolded portion of the body surface, food taken into it is not in the body, but is merely enclosed. . . . The mechanical factors of digestion have the functions of mixing the food with the secretions poured out upon it, of exposing the digested food to the absorptive wall, of propelling the food from one region of digestion or absorption to another, and finally of discharging the waste. The functions are of great import to the body, for the food if conducted too slowly along the tube may suffer harmful decomposition; and if forced too rapidly, will fail to be properly digested and will in large measure be lost." (Cannon, W. B., The Mechanical Factors of Digestion. Longmans, Green & Co. New York, 1911.)

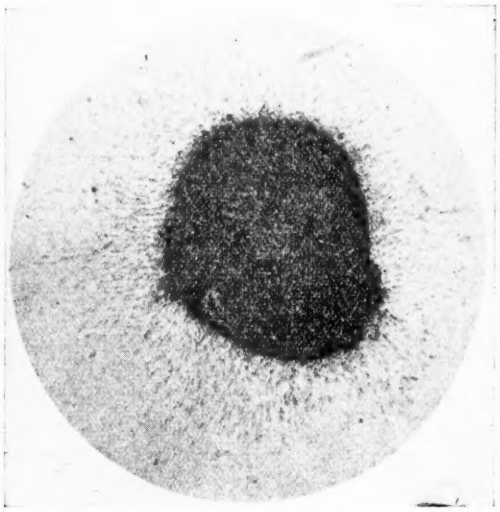

FIGURE 1. A culture of a nine-day old chicken embryo liver in a medium of embryonic extract, showing the outgrowth of fibroblasts.

FIGURE 2. A similar culture in the same medium with the addition of an extract of yeast, showing the outgrowth of liver cells.

(These illustrations are used through the kind permission of the Editor of the *Journal of Bacteriology and Pathology*.)

As nutrition is the sum of the processes by which an animal absorbs, takes in, and utilizes food substances, a means to determine the contribution made by one meal in its passage through the body, or the intestinal rate*, serves as a very definite index of absorption. In this way information may be obtained as to whether the food is conducted too slowly; but more particularly, as to whether it is forced too rapidly, fails to digest, and in a large measure is lost. In a consideration of nutrition as a phase of the animal economy, unusually good absorption should be obtained from a small amount of food. Such absorption occurs if the ways of eating are corrected to conform with the requirements to operate the proximal colon; and with it one and sometimes two dejections are common daily, yet Sunday evening's dinner does not begin to leave the digestive system until Wednesday morning, and does not pass completely through until Saturday morning. In other words, this meal is completely retained, worked over by the intestinal functions, and absorbed for about 63 hours; and is not completely discharged for about 134 hours. This is the presumably normal intestinal rate. With absorption of this kind, the aliment evidently does not suffer harmful decomposition, but rather serves to supply a large amount of nutritive material for building up the body. For instance, on Wednesday morning when Sunday night's dinner is partly discharged, the meals available for nourishment are the remainder of this dinner, all of the meals on Monday and Tuesday, and Wednesday's breakfast, or seven and a portion meals. On the other hand, when the erroneous ways of eating are not corrected, daily dejections may occur, yet most of Sunday night's dinner is often discharged after Monday's breakfast and is entirely through the body by Wednesday morning. Thus, the entire meal is only retained for about 14 hours, and is completely discharged in about 62 hours. This is a rapid intestinal rate and serves to supply a small amount of nutritive material. For instance, on Monday morning, when Sunday night's dinner is mostly discharged, the only meals available for nourishment are the remainder of this dinner and Monday's breakfast; or one and a portion meals. Thus the aliment does not appear to complete its cycle of digestion and absorption; and there

*The intestinal rate is an index of absorption, by which the contribution of one meal to the construction of the body is determined. To make the test, from 25 to 50 cc. of French millet seeds or 100 grains of charcoal are swallowed immediately after an evening meal, and then the number of hours that elapse from the time the marker was ingested to the time the seeds or charcoal are first and last seen in the dejections is observed. (Burnett, F. L., *Am. J. Roentgenol.* 10:599, 1923.)

is a failure of the final and most important phase of the nutritive processes, i.e., assimilation. A continued failure of normal nutrient substances to develop and reconstruct cells must produce deficient tissues, and an exact state of health cannot be maintained. (Burnett, F. L., *J. A. M. A.*, 85:1777, 1925.)

Valuable studies on the regeneration of cells, through improved nutrition, are beginning to supply useful information about this final, most important, complex, and delicately adjusted phase of the nutritive processes. One interesting example of assimilation has been demonstrated by Heaton. (*J. Path. & Bact.*, 29:293, 1926.) In tissue cultures of embryonic chicken liver in different media, the addition of yeast promoted the growth of liver cells; whereas in media without this substance ordinary fibroblasts, instead of the complex liver cells, were regenerated. These changes of tissue construction are illustrated in figures 1 and 2. Another example, and one of more importance clinically, has been demonstrated by Peabody. (*Am. J. Path.*, 3:179, 1927.) In sections of bone marrow removed from patients with anemia, during a relapse and also a remission from liver therapy, changes are also apparent in tissue construction. Sections removed during a re-

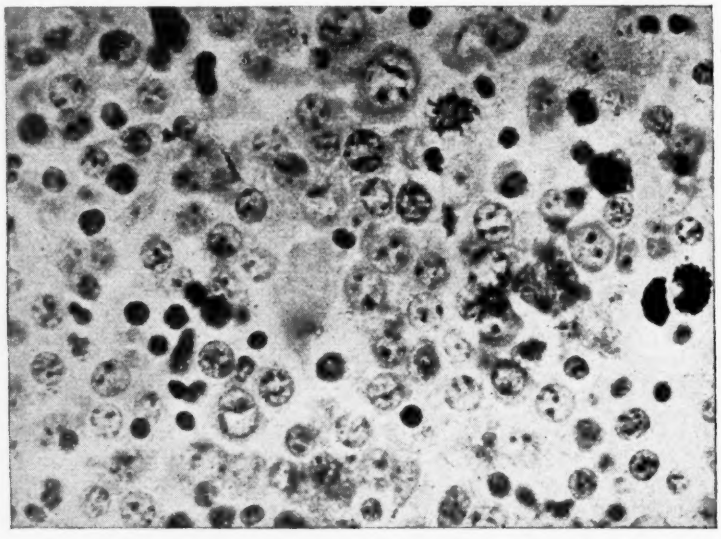

FIGURE 3. The microscopic structure of the human bone marrow, during a relapse from pernicious anemia, showing few corpuscles and many megaloblasts.

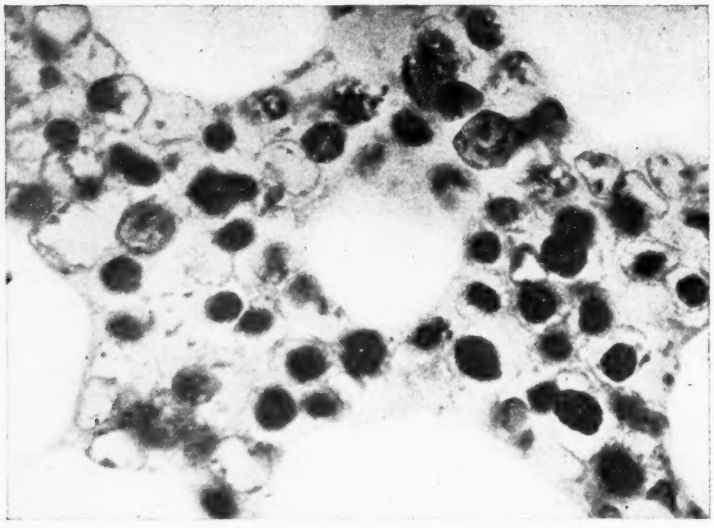

FIGURE 4. A section of the same tissue during a remission from liver therapy, showing many corpuscles and some normoblasts.

(These illustrations are used through the kind permission of the Editor of the *American Journal of Pathology*.)

lapse show especially many megaloblasts and few normoblasts; whereas sections removed during a remission show numerous erythrocytes and normoblasts, but few megaloblasts. These variations of structure are illustrated in figures 3 and 4. Finally, another example has been demonstrated by Burnett. (*New Eng. J. M.*, 205:251, 1931.) In patients with psoriasis the correction of erroneous ways of eating, to conform with the operation of the proximal colon and the normal intestinal rate, creates a kind of nutrition by which healthy cells of the skin are regenerated. The change produced in the skin by this kind of nutrition is shown by a comparison of figures 5 and 6.

FIGURE 5. Lesions of severe psoriasis.

FIGURE 6. The same skin after the regeneration of healthy cells, from improved nutrition.

Without an understanding of a nutritive process created by the correction of erroneous ways of eating, to remove the cause of disease, the restoration of health in a patient may be misinterpreted. As dietary advice is generally given, or habits of eating are often changed by patients during the treatment, the nutrition may be improved and the disease relieved. The result may be ascribed to a natural remission, the use of baths, the administration of drugs, the injections of proteins or vaccines, or the removal of foci of infection, etc., if the beneficial effects of right eating and improved absorption on health are not recognized.

FOOD, HEALTH, AND THE NUTRITIVE APPARATUS

On account of the economic crisis some families have had to reduce the amount of money spent for food, while others have had to be fed by welfare organizations. These changes in the food consumed have led to the publication of many reports on economic nutrition. One of these by Stiebeling and Ward (No. 296, U. S. Dept. Agric., Nov. 1933), of the Bureau of Home Economics, gives a great deal of useful information. In this circular, a restricted diet for emergency use, an adequate diet at minimum, and another at moderate cost, and a liberal diet, are described. Grain products, dried legumes, and potatoes are especially advocated in the inexpensive diets, while other vegetables, fruits, meat, fish, and eggs are included in the higher priced diets. The value of milk and milk products is emphasized in all of the diets. The yearly cost of the food per person varies from $61 to $165. In a comprehensive report of the amount and kinds of food required daily for a man, Aykroyd (*Quart. Bull. Health Organ.*, League of Nations, 2:130, 1933) writes that the unemployed German can get along on 2550 calories which consist of 78 Gm. of protein, 90 Gm. of fat, and sufficient calcium and phosphorus. Such food costs 1.21 RM. The food required by the unemployed Englishman is not greater, but consists of 81 Gm. of protein and 88 Gm. of fat; and costs 9¾ d. a day.

McHenry (*Canad. Pub. Health J.*, 24:308, 1933) has discussed the food of dietary standards and found it excessive. In a survey of 150 persons occupied in a college department, the average daily consumption amounted to only 2434 calories of which 12.8 per cent was protein (and 57 per cent animal), 38.2 per cent fat, and 48.6 per cent carbohydrate. Welfare feeding was also considered, and the diet ad-

vised was one in which half of the protein was derived from animal food, adequate calcium was supplied by milk and cheese, and iron was supplied by meat, eggs, cereals, and vegetables. Besides these foods, all the vitamins are assured if canned tomatoes, cabbage, and turnips are also consumed. Unemployed Russians and many children are fed at community kitchens, according to Sbarsky. (*Bull. Soc. Sci. d'Hyg. Aliment.*, 21:254, 1933.) These governmental institutions serve 2,000,000 meals a day. The regulation of the children's diet has evidently made them healthier, because the mortality rate of those under four years has been reduced in fifteen years from 26.5 to 14 per cent. Less food and better nutrition have also influenced the mortality in large German towns; for Ascher (*Deutsche med. Wchnschr.*, 59:336, 1933) reports that the mortality in these communities has been reduced from 10.6 to 9.8 per 1000, during five years. The morbidity and mortality from tuberculosis in Leipzig have been reduced from 23.3 in males and 21.2 in females per 10,000 during twenty-five years to 8.0 and 3.5 respectively. In a study of the food habits and health of families in rural New York, Morey (*Cornell Univ. Agric. Exp. Stat. Bull.*, No. 563, June, 1933) reports that the diets were not deficient, but that good meats, vegetables, or fruits were not selected, and that eggs and milk were not made the most of. Constipation, indigestion, obesity, and dental decay were frequently revealed. The inhabitants of Canton, China, according to Hoh (*J. Home Econ.*, 25:871, 1933) do not consume milk or milk products. On this account, their food appears low in calcium. Adequate amounts of the salt, however, are supplied from spare ribs cooked in rice vinegar; and other dietary factors are furnished by foods composed of soy beans. Murray (Report Carnegie Commission, Poor White Problem in So. Africa, 4:154, 1932) has described the effect of debilitating diseases, the climate, malnutrition, and home conditions on the physique and vitality of South Africans. He considers that physical causes have little to do with the production of poverty. He gives, besides, valuable data on the diets and measurements of many children.

In a study of the acid-base balance by Marples and Lippard (*Am. J. Dis. Child.*, 44:31, 1932) normal breast-fed infants exhibit a mild compensated acidosis, although the serum has a normal pH value of 7.52. The acidosis is explained by an increase of chlorides in the blood, which may be due to insufficient fluid in the body for the normal excretion of these salts by the kidney. In another study on the effect of cow's milk on the acid-base balance of infants, these investigators, Marples and Lippard, (*Am. J. Dis. Child.*, 45:294, 1933) found a slightly lower carbon dioxide content of the serum in those consuming cow's milk than in those consuming human milk. In a comprehensive study of the effects of acid and alkaline foods on the acid-base balance in man, Bischoff et al. (*J. Nutrit.*, 7:51, 1934) determined that the type of food did not alter the reaction of blood in fasting patients. The consumption of a very high protein diet for three days produced a very slight increase of acid, but a very high alkaline diet did not increase the alkalinity of the blood. Schlutz et al. (*Am. J. Dis. Child.*, 46:757, 1933) have observed the effect on the intestinal motility and mineral retention of feeding vegetables to young infants. Various kinds of spinach were used; but they did not increase gastro-intestinal motility, and little change was found in the retention of nitrogen, sodium, potassium, calcium, magnesium, iron, chlorine, phosphorus or sulphur. The reaction of bile from cholecystectomized patients has been determined by Bronner (*Klin. Wchnschr.*, 12:1562, 1933); and after a meat diet a secretion was produced with a pH 6.5, whereas after a vegetable diet one of 7.5 was noted. In liver disease, the bile was acid even after a vegetarian diet. Physical exercise after meals influences the action and the secretion of the stomach according to the observations by Hellebrandt. (*Am. J. Physiol.*, 105: proc. 48, 1933.) Gentle exercise was found to hasten the emptying time and to stimulate the secretion of the stomach; but short and violent or protracted exercise retarded its action and also caused anacidity.

Interesting observations on residues from the small intestine have been made by Landt and Daum. (*Arch. Int. Med.*, 52:96, 1933.) A patient with an ileal fistula was fed various diets and the appearance, reaction, and time of the passage of the intestinal contents were noted. Milk products produced a yellow chyme, bread and jelly a brown, and meat a green chyme, which did not have an odor. The residue of all foods varied between 92 per cent and 97 per cent of water; and gave a reaction that was about neutral. From a study of the effects of menstruation on intestinal motility Halter and Pape (*Deutsche. Med. Wchnschr.*, 59:212, 1933) point out that of 481 women, 9 per cent are likely to have diarrhea and 1 per cent constipation during their catamenia. Collens and Boas (*Arch. Int. Med.*, 52:317, 1933) found that 73 to 90 per cent of 16-25 per cent dextrose enemata was absorbed in non-diabetic patients in two hours. But 94 per cent and less of the sugar of a 50 per cent dextrose enema was absorbed in diabetic patients in two hours.

OPHTHALMIA, KERATOMALACIA, AND EYE DISORDERS

As a means to learn the incidence of ophthalmia and night blindness in the United

States, Hess and Kirby (*Am. J. Pub. Health,* 23:935, 1933) have analyzed the replies to a questionnaire of most of the leading ophthalmologists. From these reports, they find that ophthalmia has not increased of late, and only eight patients with night blindness were reported. Ophthalmia from restricted food developed among the inmates of an African prison. The restricted diet according to Mitchell (*East African M. J.*, 10:38, 1933) was due to the confusion caused by a rapid enlargement of the prison. Pellagra also developed, but the most prominent symptom of the deficiency disorder was edema. The addition of lean meat and fresh vegetables to the diet relieved the pellagra, but the eye disorder persisted and a dermatosis developed. According to Owen (*East African M. J.*, 10:53, 1933) the eyes showed dryness of the cornea, xerophthalmia, and keratomalacia; and there was also night blindness. The administration of 7 cc. of cod liver oil produced a rapid improvement of the eye and skin lesions. Jochimoglu and Logaras (*Deutsche Med. Wchnschr.*, 59:1043, 1933) have found that night blindness was much commoner in boys from five to fifteen years than in girls or adults.

The daylight study of the visual fields of some patients with vitamin A deficiency has been made by Kiang (*Nat. M. J. China,* 18:827, 1932) and all of them showed a concentric contraction of the blue, red, and white fields. This contraction, especially that of the blue field, was significant of the degree of vitamin A deficiency. A somewhat similar observation on the loss of primary and secondary dark adaptation has been made by Soudakoff (*Nat. M. J. China,* 18:819, 1932) in patients with vitamin A deficiency. And Pillat (*Nat. M. J. China,* 18:808, 1932) has reported that the brownish pigmentation of the conjunctival sac in patients with vitamin A deficiency is due to an increase of the dendritic cells in the deep and middle layers and to the intracellular pigment caps of the middle and superficial layers of the epithelium. Retinitis pigmentosa as a deficiency disease has been investigated by Levine (*Arch. Ophth.*, 9:453, 1933) because night blindness is the chief symptom. Patients with this disease were given cod liver oil, and at first the vision improved and the visual fields became larger; but in observing the treatment over a period of five years, the specific value of the oil was not proved. The relation between slight ocular disorders and the excessive ingestion of sweet farinaceous foods has been described by Ramsay. (*Brit. M. J.*, 1:266, 1933.) Patients with headaches which are not relieved by glasses, with slight diminution of vision and with disturbances of light sense are described in the article. Of more importance, however, are the children with phlyctenular conjunctivitis, who can be permanently cured by the proper restriction of sweet foods.

From a study of the consumption of vitamin A, Harris (*Brit. M. J.*, 2:231, 1933) concludes that its excessive ingestion does not reduce the incidence of respiratory infections or influence pneumonia. In a survey of the diets of English people, the author concludes that vitamin B is not often insufficient, but the amount of vitamin C may be dangerously reduced. Somewhat similar observations have been made by Hess et al. (*J. A. M. A.*, 101:657, 1933.) They found that the babies in a group which had large doses of haliver oil or carotene were quite as subject to colds, conjunctivitis and impetigo as those of another group which did not have supplementary feedings.

Lesions produced in experimental animals from deficient food resemble many human disorders, and thus serve as a clue to their etiological relationship. The means to reconstruct malnourished tissue to cure the deficient condition is the phase of experimental studies which will be most helpful in the cure of human disorders. From this point of view, Wolbach and Howe (*Am. J. Path.*, 9:275, 1933) have made an interesting study of the incisor teeth of animals in vitamin A deficiency and repair. The odontoblast during the disease loses its highly specialized character and assumes the form of an osteoblast. As repair begins the cells enlarge by an increase of cytoplasm about the nucleus, later a transitional stage to the odontoblast is apparent, then evidence of function and polarity, and finally further growth and acquisition of the normal shape. Thus defective enamel, denticles, pulp bone, and cementicles in man may be the result of vitamin A deficiency.

Another study of the reconstruction of tissue has been made by these investigators. (*J. Exper. Med.*, 57:511, 1933.) These observations relate to the epithelial repair from vitamin A deficiency. In this process the layers of keratinized cells of the eyes were found to be removed by vacuolar degeneration and heterolysis by leukocytes. Later the germinal layer formed the corneal cells. Ocular disturbances in malnourished animals have been reported by Yudkin. (*J. A. M. A.*, 101:921, 1933.) Various clinical implications were suggested by this work. A diet without vitamin A not only changes the secretion from the paraocular glands so that erosion of the conjunctiva and cornea occurs, but also changes the pigment and neuroepithelial layer of the retina, which produces poor dark adaptation. A diet without vitamin G seems to produce lenticular changes, but more observations are required to prove it. A diet without vitamin B and B_2 has not produced lesions of the lens. Animals on this diet, however, become stunted; and this may be due to changes in the intestinal tract, by

which the absorption is altered and metabolism interfered with.

BERI-BERI, PELLAGRA, AND NERVE DISORDERS

A disease like beri-beri has appeared among the fishermen of the Westman Islands in Iceland and has been described by Kolka. (*Laeknahl.*, 6/8: 18, 1933.) The chief symptom of the disease is edema of the legs, but there are also disordered heart action and nerve manifestations. It is attributed to an increased consumption of refined wheat and rice instead of rye and barley foods, and also to the decreased consumption of milk and milk products. The administration of yeast brings about rapid recovery. Lesions of the cornea in beri-beri were found by Ayuyao (*J. Philippine Islands M. A.*, 13: 158, 1933) in pregnant or postpartum patients. The disorder was thought due to a degeneration of the trigeminal nerve. Villela (*C. R. Soc. Biol.* 113: 1277, 1933) has examined the serum of a few patients with beri-beri and has found that the albumin rises with the subsidence of edema, while the globulin remains the same. Some patients with a symmetrical paresis and edema of the legs have been described by Campbell and Allison. (*Lancet*, 2: 410, 1933.) The disorder resembling beriberi was ascribed to a toxic cause, and was relieved by rest.

A malnutritional edema in patients of Tennessee has been observed by Youmans (*South. M. J.*, 26: 713, 1933.) The energy value of the food consumed by these patients was not only low, but the protein intake was often 0.6 Gm. and always below 1 Gm. per kilo of body weight. Serum albumin was reduced, but proteins were within normal range and serum globulin increased. The ingestion of yeast had no effect but the increased consumption of protein caused a rise in the serum protein.

A somewhat similar kind of edema in patients has been observed by Burnett (*Abs. Nutrition Abst. & Rev.*, 3: 564, 1933) in Freetown, South Africa. The edema is often preceded by an attack of abdominal colic. The food consumed is rich in yeast, cod liver oil, vegetables, and fruit, and therefore beri-beri cannot be diagnosed. Instead, the disease is supposed to be due to the poison from deteriorated rice. According to Meyer (*Schweiz. med. Wchnschr.*, 53: 1243, 1932) cases of polyneuritis and "funicular myelitis" were often due to a one-sided diet which resulted in conditions resembling beri-beri, pellagra, or funicular myelitis.

"Alcoholic polyneuritis" has been shown by Minot et al (*New Eng. J. Med.*, 208: 1244, 1933) to be caused by insufficient food consumption and especially that containing vitamin B. As well as could be ascertained, besides the alcoholic beverages, the food consisted of coffee and doughnuts for breakfast; soup, bread and butter, pie, and coffee for lunch; and spaghetti, bread and butter, and coffee for supper. Meat, fish, or eggs were rarely consumed. In treatment a special diet has been administered to the patients, and consists of 150-250 Gm. of beef liver pulp, 100 Gm. muscle meat, 500 cc. of milk, 200 Gm. of orange juice, and an abundance of vegetables, fruit, and butter. Some cod liver oil and yeast were also given. Cereal food was greatly reduced. Recovery was very uniform in patients consuming this food. Of seventy-three patients with pellagra admitted to a city hospital, sixty-two were reported by Spies and DeWolf (*Am. J. Med. Sci.*, 186: 521, 1933) to give a history of alcoholism. Ten of the latter were treated with a liberal and well-balanced diet, 75 Gm. of yeast, and 600-900 cc. of whiskey daily. As all of the patients made a rapid recovery, alcoholic beverages alone are evidently not an etiological factor in the cause of pellagra. In infants with toxic diarrhea, Gruenfelder et al. (*Klin. Wchnschr.*, 12: 983, 1933) tried the effect of intravenous injections of concentrated yeast preparations. The treatment was followed by a dramatic improvement, of which a diuresis of 1000 cc. in twenty-four hours was one of its most striking effects.

A concise and illuminating account of pellagra from the public health point of view has been written by Aykroyd. (*Nutrition Abst. & Rev.*, 3: 337, 1933.) The etiology of pellagra has been discussed by Chick (*Lancet*, 2: 341, 1933) who states that the theory of the amino-acid or vitamin G deficiency does not explain the association of epidemic pellagra with maize consumption. On the other hand, a more plausible theory is that a toxin occurs in maize which is made ineffective by the ingestion of good protein or vitamin G. Pellagra has been observed in the leper colonies of Korea by Wilson. (*Chinese M. J.*, 47: 287, 1933.) The disease is evidently the result of the ingestion of insufficient meat, milk, and fresh vegetables by the patients; and the consumption of pork and cod liver oil relieves the disease. Thannhauser (*München. med. Wchnschr.*, 80: 291, 1933) points out that in sporadic pellagrins severe intestinal disturbances may produce changes in the gut, and thus prevent the absorption of vitamin B. A somewhat similar point has been presented by Hofman-Bang (*Hospitalstidende*, 76: 1088, 1933) who reports that pellagra developed in some insane patients after a period of anorexia and diarrhea, and that the diet may not only have been deficient in vitamin B, but also that the malabsorption may have prevented the proper utilization of the essential food.

The hemoglobin and character of corpuscles in pellagrins have been studied by Turner. (*Am. J. Med. Sc.*, 185: 381, 1933.) Of fifty patients whose blood was examined, 50 per cent had a very slight anemia similar to that found in students; but 16 per cent had a slight anemia,

12 per cent a moderate, 12 per cent a severe; and 4 per cent a very severe anemia. In no patient was the macrocytic type observed; in fact, the size of the corpuscles tended to diminish according to the severity of the anemia.

The gastric juice, according to the work of Spies and Payne (*J. Clin. Investigation,* 12: 229, 1933), also differentiates pellagra and pernicious anemia; for that of pellagra when incubated with beef produced a response in two patients with pernicious anemia. On the other hand, Mulholland and King (*J. A. M. A.*, 101: 576, 1933) analyzed the gastric contents of 102 pellagrins and found free HCl absent in 72 per cent. The anacidity was more frequent in patients over forty years; but the degree of the reaction was not correlated with the severity of the diarrhea, with the nervous symptoms, or with the degree of anemia.

A daily dose of 60 Gm. of baker's yeast heated to fifteen pounds for seven and a half hours was effective in relieving pellagra in patients, according to Wheeler. (*U. S. A. Pub. Health Rep.*, 48: 67, 1933.) The same was true of the daily ingestion of 450 Gm. of canned peas. But the daily addition of 227 Gm. of canned haddock to a pellagra-producing diet did not prevent the development of the disease. The lesions of stomatitis, nasal seborrhea, caseous deposits about the base of the tongue, and conjunctivitis, without the characteristic dermatitis, were atypical. In another study by Wheeler and Hunt (*U. S. A. Pub. Health Rep.*, 48: 754, 1933), the effects of the ingestion of various greens on the disease were investigated. Patients on a pellagra-producing diet were given 500 Gm. of kale or canned collards daily for a year and the disease was prevented; and of those given 500 Gm. of canned green cabbage or mustard greens, only one in each of two groups became pellagrous after six and seven months respectively. Accordingly, these cheap foods should be found useful to prevent pellagra.

Ramsdell and Magness (*Am. J. M. Sci.*, 185: 568, 1933) have tried the injection of liver extract into twenty-two patients with pellagra and observed a spectacular improvement. A normal appetite was an early sign of recovery, and all the symptoms and disorders were relieved more rapidly and completely than with any other form of treatment. Liver extract has been added to the diet of pellagrins by Smith and Ruffin (*J. Clin. Investigation*, 12: 963, 1933) and good results have been obtained. They also tried the extract in dogs with black tongue and cured the disease.

A deficiency disease of adolescent schoolboys, in whom the chief symptoms are a loss of acuity of vision, sore mouth and tongue, and itching of the scrotum has been described by Moore. (*West African M. J.*, 6: 65, 1933.) Avitaminosis was suspected as the cause, because the boys often ate from restricted rations during term time but were free of the disease during the school holidays. The disease is considered prepellagrous, and treatment with cod liver oil and malt, marmite and iron has produced complete recovery in most patients. A proper diet in the school would prevent the disease. A somewhat similar kind of malnutrition in young children from eating too much cereal food has been reported by Williams. (*Arch. Dis. Child.*, 8: 423, 1933.) The symptoms were progressive loss of weight, irritability, diarrhea, edema and desquamation of the skin about the joints, and ulcers of the cornea and mucous membranes. The consumption of eggs, milk, cod liver oil, and fruit generally relieved the disease.

The results of the ketogenetic diet in the treatment of epilepsy have been summarized by Helmholz and Keith. (*Arch. Neurol. & Psychiat.*, 29: 808, 1933.) In all, 369 patients were treated over a period of ten years; but 89 would not coöperate, 42 were treated for less than a year, and 51 had symptomatic epilepsy and were not included in an appraisal of the treatment. Of the 160 remaining, 36 per cent are well, 21 per cent improved, and 43 per cent were not benefited. The biochemical effects of the consumption of the ketogenetic diet in normal individuals have been made by Apperly and Norris. (*Am. J. M. Sc.*, 185: 802, 1933.) They found that, in spite of a profound ketosis, alkalemia was generally present, and this was accompanied by a reduction of plasma and corpuscle carbon dioxide. Such a condition evidently outweighs the tendency to acidosis from the ketone acids.

SCURVY AND SKIN DISEASES

Tests for the prescorbutic condition by means of Gothlein's modification of Hess' capillary resistance method have been made on 145 patients in a hospital, by Schultzer. (*Hospitalstid.*, 76: 777, 1933.) Of this number 29 were found positive, and the condition of some was ascribed to the consumption of food containing insufficient vitamin C before admission or the restricted diet required in the treatment of gastrointestinal disturbances. In most of these patients the addition of orange or lemon juice to the food brought about an increased capillary resistance; the few not benefited had achylia, and even the simultaneous treatment with hydrochloric acid did not prove effective. Another test for the prescorbutic condition, which is a modification of Hecht's suction method, has been applied by Dalldorf. (*Am. J. Dis. Child.*, 46: 794, 1933.) Children from the poor districts of New York City were tested and many were found to be prescorbutic.

Epidemic scurvy was found to occur among the native laborers of Rhodesia and has been

studied and treated by Dry. (*Arch. Int. Med.*, 51:679, 1933.) Varying degrees of the disease were manifested; and hemeralopia, edematous and painful legs, and parasitic infections were signs of malnutrition evident in these laborers. The disease was ascribed to the practice of overcooking or discarding vitamin rich foods. The administration of proper food to patients in this class was found difficult; accordingly neutral or slightly alkaline orange or lemon juice was given intravenously. This remedy in doses of 5, 10, and 15 cc. weekly relieved the disease very effectively. A scorbutic patient who developed the disease as a result of consuming food without fresh milk, fruit, or vegetables has been maintained on this diet in a hospital by Schultzer (*Lancet*, 2:589, 1933) and also given intravenous injections of ascorbutic acid. The injection of 40 milligrams of the acid daily for ten days and the same amount every other day for a similar period produced a rapid restoration of health. Nelson et al. (*J. A. M. A.*, 101:14, 1933) report a study of radiograms of subperiosteal hemorrhages in infantile scurvy before and after treatment. Little can be seen in the negatives before the ingestion of orange juice, but afterward shadows significant of calcium deposits in the clots are an indication of healing.

In a book on Skin Diseases and Nutrition, Urbach (W. Maudrich, Vienna, 1933) states that a majority of dermatoses are not primary skin diseases, but are secondary to disturbances of nutrition and metabolism. The opinion is based somewhat on animal experiments, but largely on clinical experience. In one chapter, the author alludes to infectious fevers, disturbances of gastro-intestinal absorption, liver detoxication, and faulty digestion from fermentation, endocrine disturbances, and physical and chemical irritants as predisposing disorders in the development of dermatoses. In other chapters, many dermatoses are listed, with a discussion of the influence of diet on their treatment and the diets valuable in their relief. Psoriasis as a metabolic problem has been studied and treated by Grütz and Burger. (*Klin. Wchnschr.*, 12:373, 1933.) The disease is considered due to a disorder of fat metabolism especially. In the study, fat tolerance tests were made on twenty-one psoriatic patients, and thirty healthy subjects, and the values compared. For the test, 5 Gm. of cholesterol was given, 100 cc. of warm olive oil, and in specimens taken in four, eight, and twenty-four hours the total fat, phosphatides, cholesterol, and the esters of cholesterol were estimated. The amount of total fat and cholesterol was found higher in the psoriatics before the tolerance tests, but higher in the normal subjects after the ingestion of cholesterol and olive oil. From this indication, a diet generally free of fat and cholesterol was given, with excellent results. The disease was arrested in three to four weeks and generally relieved in one and a half to seven and a half months. An undiagnosed dermatosis of the inmates in the Uganda Central Prisons of East Africa has been observed and reported by Loewenthal. (*Arch. Dermat. & Syph.*, 28:700, 1933.) The dermatosis was frequently accompanied by night blindness and xerophthalmia; and consequently was thought due to a vitamin A deficiency. The diet consumed by the prisoners generally consisted of dried meat, sweet potatoes, beans, maize, and nuts. From the signs of the disease as well as the almost fat free diet, an ounce of cod liver oil was given the patients daily as a therapeutic test and was found to relieve promptly all of the disorders. A papular dry skin or phrynoderma has been observed by Nichols (*Ind. Med. Gaz.*, 68:681, 1933), in many of the inmates of a Ceylonese jail. Symptoms of the disease appeared soon after the prisoners received the penal diet, which was vitamin deficient and especially of vitamin A. Diarrhea, neuritis and sometimes keratomalacia generally accompanied the skin disorder.

RICKETS, OSTEOMALACIA, AND DENTAL DECAY

While children living within the Arctic Circle have been generally thought free of rickets, the disease was found prevalent among those living on the island of Kolgujew by Schastin and Petrjajeff. (*Jahrb. f. Kinderheilk.*, 140:314, 1933.) The incidence of rickets to develop among children living within two miles of the center of Manchester, England has been found by Chisholm (*Brit. J. Child. Dis.*, 30:83, 1933) to be 9.2 per cent, whereas in those living outside of this zone the incidence is only 4.6 per cent. According to Harris (*Brit. M. J.*, 2:367, 1933) correct eating cannot be left to nature or instinct, and vitamin D in a special form is necessary to protect children in temperate zones. Furthermore, cod liver oil is less effective than irradiated ergosterol. To children between one and two years, a protective dose of 1500 international vitamin D units and a curative dose of 5000 units of this special substance should be administered. Hypervitaminosis, however, should be watched for and avoided. The antirachitic potency of milk from women who consumed "vitaminized" cows' milk has been compared by Bunker et al. (*New Eng. J. Med.*, 208:313, 1933) with that from women who drank ordinary cows' milk. In the comparison, each milk was given to rachitic rats; and that from women who had taken the vitamin D milk brought about almost complete healing, whereas the other showed no healing. Hess and Lewis (*J. A. M. A.*, 101:181, 1933) have appraised the curative effects in human rickets of irradiated milk, the milk from cows given

irradiated yeast, and irradiated ergosterol. All of the preparations had the same antirachitic potency for rats; but a daily ration of 42 "rat units" of irradiated milk, or 90 "rat units" of "yeast" milk had a marked curative effect for infants, but even 320 "rat units" of irradiated ergosterol did not produce healing for infants. The irradiated milk is recommended in prophylactic treatment.

An interesting case report of osteomalacia has been made by Schultzer. (*Am. J. Med. Sci.*, 186:532, 1933). The patient was a middle-aged postal clerk who had eaten no meat or fish for twenty years. He fell and injured his hip a few years ago. Since then the joint has become progressively painful and recently he has had to give up work. Roentgenograms showed a marked deformity of the pelvis and vertebrae and a severe arthritic process of the hip, with coxa vara. Treatment with cod liver oil, irradiated ergosterol, and calcium chloride proved effective; for in three months good calcification had taken place, as shown by another roentgenogram, and the patient was able to resume work. Abortive forms of osteomalacia have been observed by Riese. (*München. med. Wchnschr.*, 80:600, 1933.) The disorder may occur frequently in childbearing women and be diagnosed as arthritis. Dietary treatment, with vitamin D and calcium therapy, is recommended.

A valuable study of the control of dental caries in out-patient children has been made by Howe et al. (*Am. J. Dis. Child.*, 46:1045, 1933.) In those who consumed the diet advised for a year and a half, an average reduction of 80 per cent of carious teeth was found; whereas in those who would not coöperate, an examination after the same period revealed an average increase of 13 per cent of carious teeth. The diet advised consists of a quart of milk, one egg, meat or fish generally, also a raw vegetable or canned tomato, at least two other cooked vegetables, two servings of fruit and of oranges especially, and butter on vegetables and bread, daily. Cereals and bread were reduced on account of their acidity. A little candy is sometimes allowed at meals, and cod liver oil is consumed occasionally. After a somewhat similar study, Kugelmass and King (*Arch. Pediat.*, 50:307, 1933) state that dental caries is merely a sign of a constitutional disorder. The influence of age and oral infection on the teeth is discussed; but the nutrition, and especially that brought about by the consumption of predominantly basic food, reduces the incidence of caries. Brodtbeck (*Schweiz. Ztschr. f. Hyg.*, 4:220, 1933) makes the assertion that the high percentage of caries in the young is attributable to a change in the standards of living, by which larger amounts of meats, sugar, bread, and cereals are consumed. This is because the incidence of caries was reduced during the World War, when these foods could not be readily bought. Observations on the value of raw milk to relieve dental caries in children have been made by Sprawson. (*Scotch J. Agric.*, 16:23, 1933.) In an institution of 750 boys the addition of this milk to the food for three years showed a marked drop in the number of patients requiring dental treatment. Moreover, the examination of forty half-grown children, who had consumed this milk from infancy, showed almost complete absence of caries; and that of a similar group of fifty-eight children, who had consumed the milk after the age of six, showed no cavities in the teeth appearing after this time.

VITAMIN E AND PREGNANCY. GOITER

Sterility and habitual abortion in women have been treated with wheat germ and wheat germ oil by Vogt-Moller. (*Hospitalstid.*, 76:621, 1933.) A dose of forty drops of the oil was given three times a day from the third to the seventh month of pregnancy; then, later a dessertspoonful of wheat germ was given in the same way until parturition. As a result, seventeen of the twenty women who had aborted gave birth to living children. Observations on the relation of toxemia to the increase in weight of pregnant women have been made by Siddall and Mack. (*Am. J. Obst. & Gynec.*, 26:244, 1933.) Great variations in weight were found to occur, especially during the last four months. Excessive gains during some periods were observed in most women that developed the late toxemia, but they also occurred in some women that had normal pregnancies; and therefore they are of questionable value in the recognition of impending toxemia. The dietary habits of American women during pregnancy have been studid by Coons (*J. Am. Dietet. A.*, 9:95, 1933); and found to vary greatly not only in the different women observed but also in the same woman during this period. The average consumption of food was about 2500 calories daily; of which 70 Gm. was supplied by protein, 103 Gm. by fat, and 336 Gm. by carbohydrate; and it also contained 1.24 Gm. of calcium, 1.52 of phosphorus, 0.38 of magnesium, and 15.22 mg. of iron. Mellanby (*Lancet*, 2:1131, 1933) has explained the need and use of suitable food to prevent some of the disorders of pregnancy. The consumption of foods containing calcium, phosphorus, iron, iodine, etc., is especially necessary. The calcium content of milk from nursing women on a calcium poor or a calcium rich diet was of the order of 8-15 per cent according to the work of Herz. (*Ztschr. f. Kindrh.*, 54:413, 1933). On the poor diet, the calcium in the milk exceeded the amount ingested; and on the rich diet, which was made up by the addition of calcium citrate or malonate, it remained unchanged.

Studies in the reproduction of the rat from

changes of food consumption have been continued by Macomber. (*New Eng. J. Med.*, 209: 1105, 1160, 1235 and 1277, 1933.) A marked reduction of protein in the food of these animals did not affect pregnancy, but it reduced fertility and somewhat inhibited lactation. A 30 per cent reduction of food not only greatly prolonged the periods between estrus, but most of the animals became temporarily sterile. An exact histological investigation of lesions produced in rats from E avitaminosis has been carried out by Mason. (*Am. J. Anat.*, 52: 153, 1933.) Testicular atrophy from D avitaminosis in rats or from C avitaminosis in guinea pigs was indistinguishable histologically from that produced in the animals by partial starvation. The atrophy from a food without vitamin E in rats produced a liquefaction of the chromatin material of the spermatozoa and spermatids, and later of the less mature cells; and this was followed by the fusion of injured spermatids and spermatocytes into giant cells. The damage produced in the cells by a combined deficiency of vitamins A and E was less severe than that produced by E alone, but the time to produce the characteristic lesions was decreased.

In an extended survey of the school children and factory workers in the districts of Kampen, Breda, etc. by Jitts (Bull. office internat. d'hyg. pub., 25: 458, 1933) goiter was found endemic, but those in the districts of Gronigen, Zutphen, etc., were generally without enlarged thyroid glands. Freedom from the disease in one part of Holland compared with another was ascribed to the drinking water; for where the disease was endemic the iodine content was low, as the water came from deep wells; but where only a few patients were observed, the iodine content was high, as the water came largely from the surface. A survey made of 40,000 school children in Derbyshire, England, by Tunton (*Proc. Roy. Soc. Med.*, 26: 1223, 1933) showed that endemic goiter was not caused by a single factor. The incidence is highest in the limestone districts of the north. Faulty water supplies leading to gastro-intestinal disorders, imperfect food supply, mineral imbalance, and deficiency of iodine or vitamins may contribute to the development of the disease. Interesting observations on the incidence of goiter in the Far East have been made by McClendon. (*München. med. Wchnschr.*, 80: 1039, 1933.) The people of Japan are generally free of goiter, which is ascribed to the very general use of seaweed in the food; but in parts of China it is very prevalent, and in an analysis of the food commonly consumed it was found very low in iodine. The iodine content of three marine plants, fifteen marine animals, and sea salts used as food in a coastal district of China has been analyzed by Adolph and Whang. (*Chinese J. Physiol.*, 6: 345, 1932.) From these tests the iodine intake of a country dweller was found to be 0.066 mg., while that of a city inhabitant was only 0.033 mg. per day.

The use of iodized salt for ten years by the inhabitants of a town in Switzerland has been studied by Eggenberger. (Bull. Eidg. Gesundhutsamtes, No. 18, 9-16 (supplement), 1933.) Formerly, the incidence of goiter in this town was very high, but now by the use of a table salt containing 10 mg. of potassium iodide per kg. the disease in infants is rare, while in those with the exophthalmic type it has decreased. In another Swiss district in which 70 to 90 per cent of the people used iodized salt, Graemiger (*Sweiz. Ztschr. f. Hyg.* No. 4, 230, 1933) has observed that goiter in school children has disappeared and new patients with exophthalmic goiter have not been found.

The relation between food and goiter has been pointed out by McCarrison (*British M. J.*, 2: 671, 1933) from instructive experiments on rats. The conclusion reached is that "the more perfect the constitution of the diet the more normal the thyroid gland, both as to its size and as to its action." McCarrison and Sankaran (*Indian J. M.*, Research 21: 183, 1933) have studied the effect of iodine on the growth of thyroid tissue in cultures. Embryo chicken thyroid in a medium of hen plasma, chicken extract, Tyrode solution and increasing amounts of sodium iodide were observed. A medium with 12.5 γ of iodine showed little acceleration of growth over the control medium without iodine; but that with 25 γ a moderate growth, and that with 50 γ or 100 γ a marked growth.

ANEMIA AND PROTEIN METABOLISM

In an interesting study of the blood of infants born of anemic mothers, Strauss (*J. Clin. Investigation*, 12: 345, 1933) has found the hemoglobin and corpuscles normal, irrespective of whether the women were 30 per cent or 55 per cent anemic. Such a fact demonstrates that the fetus obtains sufficient blood-building material for its own requirements in spite of the condition of the mother. This fact has been confirmed in part by the observations of Neale and Hawksley. (*Arch. Dis. Child.*, 8: 227, 1933.) They found also that anemic mothers generally produce full-blooded infants; but when twins are born one infant may be anemic. A comprehensive study of the anemias of infancy has been made by Parsons et al. (*Arch. Dis. Child.*, 8: 85, 95, 117, 159, and 184, 1933.) Congenital nutritional anemia is considered due to a defective antenatal storage of iron and acquired nutritional anemia to a postnatal storage of iron. Good responses were brought about in both disorders by the use of ferrous sulphate in glucose. The sugar was found to contain a little copper. Two infants had hyperchromic anemia from celiac disease, and one responded to the use of desiccated gastric mucosa. Abt

(*Illinois Med. J.*, 64:572, 1933) distinguishes two types of nutritional anemia. One is secondary to infections, from a lowered resistance due to dietary errors, and the other is the result of insufficient iron-containing food in the diet. Cooking oysters in the infants' soup is suggested.

Many women compared with the men and children of a Scotch city were found anemic by Davidson et al. (*Brit. M. J.*, 1:685, 1933.) The disorder was ascribed to frequent pregnancies and loss of blood at parturition, but an investigation of the women's food showed that an average of only 6 mgs. of iron was consumed daily. As a preventive, the ingestion daily of a glass of milk containing iron and ammonium citrate is recommended. A survey of the incidence of anemia to the diets of the inhabitants of North and South Sweden has been made by Werdinius. (Gleerupska Univ. Bokhandel, Lund., 271, 1933.) Anemia, achlorhydria, diarrhea, constipation and intestinal ulcers are much commoner in the northern than in the southern people. Many of these in the north live on cereals, milk, and potatoes, but no other vegetables, and little meat or fish; whereas those in the south consume more liberal diets, which generally include meat, bacon, butter, milk and vegetables. In the anemia of pregnancy of Indian women, Mudaliar and Rao (*Indian J. M. Research*, 20:435, 1932) report that the incidence of the disease in vegetarians and nonvegetarians was about the same. The disease was promptly relieved by the ingestion of liver or ventriculin, but marmite was not effective. Mattier et al (*Am. J. Med. Sci.*, 186:694, 1933) have studied the effect of a rich and a predigested iron-containing food on the regeneration of corpuscles in hypochromic anemia. The former diet calculated to give 16-20 mg. of iron daily was ineffective; but the latter, predigested with HCl and pepsin and calculated to give 12.5 mg. of iron daily, produced excellent results in the patients who failed to respond to the other diet.

An attempt has been made by Van Leeuwen (*Klin. Wchnschr.*, 12:698, 1933) to separate the simple achlorhydric from the enteric anemia. The latter is the result of a long-standing enteritis, by which there is a general failure of absorption and especially of iron; but many of these patients have normal gastric juice. In the treatment of secondary anemia, Murphy (*Arch. Int. Med.*, 51:656, 1933) has compared the use of intramuscular injections of liver extract and the consumption of adequate doses of iron with the consumption of whole liver and iron. The former proved slightly superior. Walters and Woodard (*Am. J. Physiol.*, 104:364, 1933) have observed that the consumption of fetal calves' liver produces a significant increase in the percentage of hemoglobin and in the number of corpuscles of normal men. A few weeks after the cessation of the calves' liver diet, as well as one of the beef liver and gastric extract, the number of corpuscles was reduced more in these subjects than in the controls. A marked reduction in the corpuscle counts of normal men has been produced by Rothmann (*Ztschr. f. klin. Med.*, 123:620, 1933) from the ingestion of large amounts of butter, margarine, or oils. Such a diet has been found effective in the treatment of polycythemia.

A valuable investigation of the pathology of sprue anemia has been carried out by Rhoads and Castle. (*Am. J. Path.* 9 supl.:813, 1933.) From a study of sections of the marrow removed from patients during the disease, and again during remissions from liver therapy, structural changes were found to occur in the cells as they do in pernicious anemia. A microcytic anemia has been produced in monkeys from malnutrition by Wills and Bilimoria. (*Indian J. M. Research*, 20:391, 1933.) The diet was one composed of polished rice, white bread, and chapatti. In treatment, the addition of foods containing vitamins A and C was ineffective; but the disorder responded to the ingestion of vitamin B in marmite. The hemoglobin production factors of human liver have been estimated by Whipple and Robscheit-Robbins. (*J. Exper. Med.*, 57:637, 1933.) It was estimated by feeding it to standardized anemic dogs, and in comparison with pigs' liver, which served as a standard control, it was found 1.6 times more potent.

A restriction of protein in the food of nephritic patients is recommended by Mosenthal (*J. Am. Dietet. A.*, 9:81, 1933) only when retention uremia complicates the disease. Otherwise the restriction may favor edema and degeneration of the kidney, predispose to current infections, or cause general malnutrition and anemia. On account of the poor results obtained with forty nephritic children by a low protein diet, Aldrich and Boyle (*J. A. M. A.*, 100: 1979, 1933) advocate a somewhat similar point of view. Accordingly, they gave the children a high vitamin and protein diet, and noted not only a definite clinical improvement but also a normal pressure and a normal non-protein-nitrogen content of the blood. In feeding patients with heart and kidney disease, Elias (*Wien. klin. Wchnschr.*, 46:400, 1933) recommends rest in bed and the ingestion of only black coffee and brandy for a few days. Then potato and gruels are given for a similar period; and subsequently vegetables and salads with a very limited amount of salt are allowed. Finally, protein and a gradual transition to a general diet are carried out.

DIABETES, CARBOHYDRATE, AND FAT METABOLISM

Diabetes is now one of the chief causes of death in the U. S. A., and the death rates from

the disease are increasing throughout the world. Besides these observations, Joslin and Dublin (*Am. J. M. Sc.*, 186:753, 1933) also find that the death rate is much higher in women than in men, in Negroes than in white persons, but generally low in children. Figures of the death rate from diabetes in some large cities of the United States during recent years have been compiled by Hoffmann. (*Spectator*, July 6, 1933.) In 1912, the rate was 15.9; in 1931, 24.6; and in 1932, 26.3 per 100,000 population. Statistics of the sugar consumption here and abroad show a similar rise, and while there is not a precise correlation, nevertheless high death rates generally coincide with excessive sugar consumption.

A liberal choice of food by diabetic children and the control of the disease with insulin is recommended by Stolte. (*Med. Klin.*, 29: 561, 1933.) The excessive ingestion of fat alone is considered injurious, as it causes hyperglycemia and metabolic disorders. A somewhat similar point of view is expressed by Downie (*M. J. Australia*, 2:367, 1933) from a study of diabetes in childhood; for he believes that adequate food should be allowed for the physical activity and growth of these patients. A daily consumption of 40 to 70 calories, and 2 to 3 Gm. of protein per kg. of body weight, and a proportion of 1:1, or 2:1 of carbohydrate to fat, is controlled by the use of insulin. The excessive ingestion of fat by six to twelve year children has been studied by Hirsch-Kaufmann and Knauer (*Med. Klin.*, 29:562, 1933) and was found to cause as much of a rise in the blood sugar curve as the excessive consumption of dextrose.

Observations have been made by Gray and Sansum (*J. A. M. A.*, 100:1580, 1933) on the use of the high carbohydrate diet by middle-aged diabetics, over a period of seven years. The diet had a ratio of carbohydrate to fat of 2:1, and some of the patients took insulin. All patients reported an improved sense of physical fitness, many an apparent increase of tolerance, and no deaths of uncomplicated coma occurred. The chief complication was arteriosclerosis. Similar observations have been reported by Eason and Lyon. (*Lancet*, 1:743, 1933.) The effects of a low, as well as a high glucose fatty acid ration in diabetic patients were studied for similar periods: and all patients took insulin. The amount of insulin was reduced in sixty-one patients consuming low ratio diets but increased in thirty of the patients during the period. However, the insulin required was not proportionate to the amount of carbohydrate, but to the amount of food consumed. On this account, the authors recommend liberal diets. Williams (*Lancet*, 2:858, 1933) has studied by means of tolerance tests the carbohydrate metabolism of women who had had many inexplicable miscarriages; and found high sugar curves. Nineteen of these women were treated with a reduced carbohydrate food and insulin, and eleven full-term healthy infants were born. Of twenty other non-pregnant women with a similar history, fourteen showed a reduced sugar tolerance. An atrophy of the islets in the pancreas of fish from overeating, the consumption of disproportioned foods, and insufficient exercise has been observed by Hess. (*Anat. Rec.* 57, No. 4, Suppl. 37, 1933.)

The sugar and lipoids of cells and plasma of healthy persons and diabetics have been studied by Partos and Herzog (*Ztschr. f.d. ges. exper. Med.*, 34:374, 1932) and were not found constant. The amount of sugar in the blood, especially, is not always an accurate index of glucose metabolism; because there is an autonomic regulation by changes in the permeability of the cells to glucose by alterations of their cholesterol content. In diabetes, the cell ratio was less than normal. After the use of insulin there was a smaller loss of sugar in diabetes than in health, while there was a marked fall of cholesterol which was equal in both conditions. After the use of adrenalin the plasma sugar rises more in diabetes than in health, while the cholesterol content increases in health and falls in diabetes. The authors suggest that in diabetes the fall in the cholesterol of the cell increases its permeability for glucose. The free and total cholesterol content of the blood of normal women on diets containing a varied amount of the fat salt has been determined by Okey and Stewart. (*J. Biol. Chem.*, 99:717, 1933.) The women consumed successively for monthly periods a diet low in cholesterol, another containing a moderate amount of the substance from egg yolk and liver, and a third containing little cholesterol in the food but made equal to the previous diet by the addition of the salt. The last two diets produced higher blood cholesterol values, but that with egg yolk gave rise to the largest amount.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 20281

PRESENTATION OF CASE

First admission. A sixty-one year old unemployed Irish shoemaker entered for the first time twenty-seven months before his sixth and last admission.

Three years before entry he first noticed epigastric pain appearing two or three hours after meals and relieved by food and soda. He was treated with a milk and cream diet. Nine months before entry he was operated upon at a hospital for a perforated ulcer. Following the operation and recovery the pain returned, but was not so severe. Twenty-two months before this entry he first noticed lumps in the axilla and groin. These gradually enlarged. A physician did a biopsy five months later and then instituted x-ray treatment. Gastro-intestinal symptoms increased and culminated in hematemesis and melena one year before entry. Four months before entry he returned for more x-ray treatment. This was followed by further increase in the gastro-intestinal symptoms. Six weeks before entry the pain became very severe and occasionally penetrated to his back. Recently there had been recurrent enlargement of his glands. At no time did he remain faithful to his diet.

His father died of carcinoma of the stomach.

The patient had an attack of pyelitis six years before entry. He had occasional dyspnea and palpitation. During the past year he had lost five pounds.

Physical examination showed numerous patches of deficient pigment on the skin of the hand, lower abdomen and genitals. There were pea to hazel nut sized glands in the cervical and axillary regions. The heart and lungs were not remarkable. The abdomen showed an old laparotomy scar. There was definite but slight tenderness in the epigastrium upon pressure. The blood pressure was 100/70.

The temperature was 99°, the pulse 80, the respiration 22.

Examination of the urine was negative. Examination of the blood showed a red cell count of 3,300,000, a hemoglobin of 70 per cent, a white cell count of 6,600, with 75 per cent polymorphonuclears. The stools were negative. A Hinton test was negative. The non-protein nitrogen was 26 milligrams. A gastric analysis showed a normal amount of free hydrochloric acid.

A gastro-intestinal series showed a deformity of the antrum and duodenum which appeared to have increased since the earlier examination in the Outpatient Department. The deformity was unusual in character, was not characteristic of ulcer, nor did it give the usual picture of adhesions. It was very suggestive of lymphoma. In view of the patient's history however the findings could have been due to adhesions resulting from the ruptured ulcer and operative procedure. A chest film showed no evidence of disease.

The patient was given further x-ray treatment and put on a Sippy régime. He was discharged ten days after admission.

History of interval. Following his discharge he had three gastro-intestinal x-ray series in the Outpatient Department. These were all typical of duodenal ulcer. He remained symptom free on an ulcer diet until one month before entry, when he developed a diarrhea, and then more ulcer pain one week before entry.

Second admission, thirteen months after his discharge. Examination was as before. He had several series of x-ray treatments. A biopsy of a tonsil showed Hodgkin's disease. He was discharged at the end of two weeks.

History of interval. He was in poor health until two and a half months after his second discharge, when he returned for x-ray treatment. This was followed by vomiting of blood and tarry stools. He remained in bed for about a month. He had more ulcer pain and some symptoms referred to the nasopharynx.

Third admission, fifteen weeks after his second discharge. Examination showed infiltration of the nasopharynx. A gastro-intestinal series at this time showed deformity of the pylorus as well as the duodenum. X-ray treatment of the tonsillar area relieved the symptoms. He was discharged in three weeks.

History of interval. He was weak and miserable for the next fourteen months.

Fourth admission. He was in the hospital for ten days for further x-ray treatment.

History of interval. He was fairly well for a time, but he entered because of tender swellings in both temporal regions. He had nearly constant epigastric distress and marked urinary frequency and dribbling.

Fifth admission, three months after his previous discharge. X-ray examination of the skull showed some destruction of the parietal bones. The spine was normal.

All the symptoms were improved by x-ray treatment. At the end of two weeks and a half he was discharged.

History of interval. For the first two months after his discharge he was able to be up part

of the time. During the third month he was confined to bed because of marked weakness. His appetite was very poor. He had very little pain and not much vomiting. He had no pain in the head and no urinary difficulty. The day before readmission a painless red rash appeared on the left side of the chest.

Sixth admission, three months after his fifth discharge.

Physical examination showed a pale, emaciated man too weak to sit up. He answered questions poorly and showed little interest in himself. The skin was dry. A few small generalized lymph glands were felt. There was pigmentation of the abdomen and x-ray alopecia of both temporal regions. There was a two-inch band of superficial hemorrhagic vesicles over the sixth costal nerve distribution on the left. There were many small follicular hemorrhages over the chest and abdomen. There was marked arcus senilis. The pupils were slightly irregular and showed lateral nystagmus in both directions. The fundi were normal. The heart and lungs were normal. The blood pressure was 90/60. The liver edge was felt three fingerbreadths down in the flank, and in the epigastrium there was a firm mass halfway to the umbilicus which may have been liver. The spleen was not felt. There was moderate pitting edema of the ankles.

The temperature was 101°, the pulse 114, the respiration 28.

Examination of the blood showed a red cell count of 2,800,000, a hemoglobin of 60 per cent, a white cell count of 20,500, with a differential of 31 per cent polymorphonuclears, 54 per cent lymphocytes, 8 per cent large mononuclears, 6 per cent myelocytes, 15 per cent smudge forms and one per cent unclassified. The platelets were decreased in number.

He rapidly went downhill and died five days after entry.

Clinical Discussion

Dr. George W. Holmes: This patient's chest is unusually clear for a patient apparently dying with Hodgkin's disease. There is nothing in the record and nothing in the films to indicate that at any time he had involvement of the hilus or mediastinal glands. I have seen a number of cases where the lesion was confined to the abdomen and the patient died without chest involvement, but it is rather unusual to have a generalized process without lesions in the chest.

Dr. Tracy B. Mallory: Would that be true for other forms of lymphoma, Dr. Holmes?

Dr. Holmes: Yes, I think so.

He had some symptoms which could be attributed to invasion of the cord. These lateral films fail to show any evidence of destruction of the bodies of the vertebrae. It does occur occasionally in these cases, but we have no lead here. It is stated in the x-ray report that there is some evidence of involvement of the parietal bone. I cannot point it out on this film. I should call the film negative.

When we come to the most interesting part, the gastro-intestinal tract, we find that he had a definitely large stomach, which suggests pyloric obstruction, and deformity in the pyloric ring with absence of filling of the duodenum. From what has been read from the records and from these films one would suspect a lesion that involved the pyloric ring, possibly both the stomach and the duodenum. In addition to that he has rather large and prominent gastric rugae for a stomach as dilated as that one was. In cases of lymphoma the findings on which we base an x-ray diagnosis are marked prominence of the gastric rugae and a multiple lesion, a lesion which involves the stomach and duodenum or a lesion which involves the stomach and some other part of the intestinal tract. Of course this is not positive evidence, but by far the most common multiple lesion of the gastro-intestinal tract is lymphoblastoma. There is nothing in this particular case that would allow me to make a positive diagnosis. We cannot say with certainty that it is multiple. It may be ulcer of the duodenum with adhesions.

Dr. Chester M. Jones: This patient interested me because he is like one of several others we have had with Hodgkin's disease and a long story of duodenal ulcer. As I recall it we have had three cases.

A Physician: I think all told we had six or seven.

Dr. Jones: At any rate the ones that I have seen have responded perfectly well to medical ulcer treatment up to a certain point. One I can recall particularly had a period of several years of more or less freedom from ulcer symptoms. He came into the ward and the question came up as to whether or not he should have radiation over the ulcerated area which involved more and more stomach and duodenum, and also whether this lesion was associated with the remainder of the disease. Did we dare to give him x-ray treatment? My recollection is that this other patient did have x-ray treatment and did have subsequent bleeding. I am not sure that radiation was the cause of the rapid breaking down of the tissue and the hemorrhage, but such a question must be raised.

The other point is that the cases we have had with ulcer symptoms have been pretty well controlled by medical treatment.

Clinical Diagnosis

Hodgkin's disease.

Anatomic Diagnoses

Lymphoblastoma of stomach, liver, spleen and retroperitoneal glands.

Bronchopneumonia.
Pulmonary edema.
Arteriosclerosis, aortic and coronary.
Herpes zoster.
Acute and chronic inflammation of posterior root ganglia.

PATHOLOGIC DISCUSSION

DR. MALLORY: Exactly where the impression arose that this man had Hodgkin's disease I have not yet succeeded in tracking down. He certainly did not have Hodgkin's, but he did have a diffuse lymphosarcoma which involved his stomach very extensively, running quite a way up his esophagus and just passing the pyloric ring into the duodenum. At the lower end of the lesion in the region of the pyloric antrum, the pylorus itself, and the first portion of the duodenum, this was fairly deeply ulcerated. The remainder of the lesion showed only the marked thickening of the gastric rugae that one very commonly sees in lymphosarcoma. He had involvement of other organs as well. The liver was greatly enlarged. The spleen was moderately enlarged and I should think at six hundred grams it should have been palpated. The retroperitoneal nodes were greatly enlarged. The lungs were free and the tracheal lymph nodes apparently so.

One point that interested us about the case was the terminal manifestation. At his last entry, about four days before death, he broke out with a series of vesicles running along the course of one of the intercostal nerves, a pretty typical zoster appearance. We have had two cases of Hodgkin's at autopsy showing this. This is the first lymphosarcoma that has come to autopsy shortly after zoster. A fair number of cases have been seen in the Tumor Clinic; it does not necessarily mean that the patient is surely bound for the postmortem table.

Have you any comment, Dr. Chapman? You saw a number of these cases.

DR. EARLE M. CHAPMAN: Yes, I have seen a number. In fact I think I caught it. I came down with it four days after seeing one of the cases.

DR. MALLORY: I can vouch for Dr. Chapman on that point. He certainly had a moderate but typical zoster coming on four or five days after examining and handling one of these cases. This association has been pointed out before. A paper from the Memorial Hospital in New York suggested that it was due to involvement of the dorsal ganglion with Hodgkin's disease. In all of our cases we have investigated the dorsal ganglion, and it has been entirely free from tumor but has shown inflammatory lesions. It is interesting that the inflammatory lesions have not been confined to the ganglion of the affected nerve. The other ganglia have shown similar but not such marked changes. I think that Dr. Chapman's experience would point very strongly to an infectious type of herpes rather than a mechanical or toxic affair.

DR. JAMES B. AYER: I should like to ask what kind of inflammatory lesion.

DR. MALLORY: I wish Dr. Kubik were here to tell you. He studied it much more carefully than I did. There was infiltration with polymorphonuclears and lymphocytes as I remember it, without necrosis.

DR. AYER: Polynuclear?

DR. MALLORY: In part polynuclear, also in part lymphocytic.

DR. AYER: Those were not the cases with the cells in the fluid?

DR. MALLORY: I do not think the cerebrospinal fluid was examined.

DR. HOLMES: This problem of shingles in connection with these malignant cases is interesting. We thought at the time that it was due in this case to heavy radiation. It certainly not infrequently follows heavy radiation over the spine, but only in cases with malignant disease. I do not remember having seen it occur in a patient who did not have carcinoma or lymphoblastoma. It may be merely that the resistance is lowered to infection. It is known, however, that radiation does produce some lowering of resistance to infection.

Another important point in the treatment of these cases involving the gastro-intestinal tract is whether they should receive irradiation or surgery. I am in favor of surgery followed by irradiation.

I should have used the term lymphoblastoma instead of Hodgkin's disease. I think of them as one disease. Some of the statements that I made apply to lymphoblastoma rather than to Hodgkin's disease.

CASE 20282

A forty-five year old Russian Jewish peddler entered complaining of abdominal pain and a tendency to constipation of eleven days' duration.

Thirteen days before admission he worked out of doors all day in a cold rain. The following day he felt restless, but not ill, and rested at home. The next morning he had a sense of fullness in the throat, but was able to work all day. Five minutes after his supper he had a severe shaking chill which continued for about thirty minutes until he went to sleep. About midnight he awoke to find himself sweating profusely. The following morning, ten days before admission, he awoke with severe constant pain involving the midportion of the abdomen on both sides of the umbilicus. For the first time in several years he failed to have his usual morning stool, and noted considerable eructation. He took a cathartic, which pro-

duced two or three soft movements the following day. There was no nausea, but the pain persisted up to the time of entry, interfering considerably with his sleep. As the tendency to constipation continued, he took laxatives or enemata every other day. On one occasion following a dose of castor oil he vomited, but brought up nothing but the oil. After the onset of the pain he took practically no solid food, restricting himself largely to milk and orange juice. Five days before entry a cold abdominal compress prescribed by his physician gave some relief.

The family history is non-contributory.

He had been married twenty-three years. His wife was living and well. There were two children, twenty-one and nineteen years of age. There had been one miscarriage subsequent to these two pregnancies.

He drank about two wine glasses of distilled liquor daily.

Two years before entry he had an upper respiratory infection characterized by severe productive cough. Since that time he had had a slight chronic cough with the production of a small amount of sputum, never foul or blood streaked.

Physical examination showed a tired looking middle-aged man with a worn facial expression. The heart and lungs were entirely negative to auscultation and percussion. The blood pressure was 100/80, the pulse 80. The abdomen was distinctly distended, tympanitic throughout, with a vague sense of resistance not thought to be spasm in the midline in the epigastric region. One examiner described an indefinite mass descending with respiration just to the right of the midline in the epigastrium.

The temperature on admission was 100.8°, but dropped on admission to the ward to 99°, where it remained until the fifth day, when it rose to 100.7°, with a terminal rise to 101° by rectum. The pulse varied from 60 to 100. The respirations were constant at 20, except for a terminal rise to 40.

Blood examination on entry showed 4,100,000 red cells, 70 per cent hemoglobin. The white cell count was 13,200, with 78 per cent polymorphonuclears. Three urine specimens ranged from 1.020 to 1.024 in gravity and were free from albumin and sugar. The sediment showed rare white blood cells but no red cells or casts. Two stools were brown and guaiac-negative. The Hinton test was negative.

A flat x-ray film of the abdomen showed a normal-sized right kidney and no areas of calcification in the region of either kidney, the ureters or the bladder. A barium enema showed no evidence of pathology in the colon.

The patient continued to complain of midline upper abdominal pain without essential change over a five-day period. On the fifth day he developed sudden pain in the lower right chest, followed on the sixth day by the appearance of dullness and diminished breath sounds at the right base. A chest film at this time showed normal findings in the left half of the chest. The right diaphragm was hazy. The costophrenic angle was obliterated by homogeneous dullness which appeared to extend slightly upward in the axillary border. There was practically complete limitation of respiratory motion of the right diaphragm as observed by fluoroscopy. The heart shadow showed no definite variation from the normal. The findings were considered consistent with an old infectious process at the right base or a diaphragmatic pleurisy on the right. The radiologist inclined to a small lesion involving the right lower lobe and a pleurisy over this area.

On the seventh day the patient complained for the first time of tenderness in the right calf, where examination showed a palpable tender cord, evidently a thrombosed vein. At noon that day, contrary to orders, he walked to the bathroom, where he collapsed to the floor. He was brought back to his bed complaining of substernal pain. On examination he showed definite cyanosis. The blood pressure at this time was 90/70. The respirations jumped to 40. There was no change in the auscultatory findings in the chest. No venous engorgement could be made out. For several hours he remained in a condition suggesting a moderate degree of shock, his color gradually improving and the blood pressure remaining approximately constant. The morning of the eighth day he showed a deep leaden cyanosis and was practically pulseless, the blood pressure unobtainable. There was marked hyperpnea. No physical signs suggestive of collapse or pneumothorax could be made out. He was placed in an oxygen tent without significant relief of his cyanosis. The neck veins shortly before death became markedly congested and questionable gallop rhythm of the heart was heard. He died on the ninth day, approximately twenty-six hours after his collapse.

Differential Diagnosis

Dr. Richard H. Sweet: The more I think about this case the more interesting it becomes to me. It occurred to me that even in the presence of the pathologist it seems almost reasonable to make a definite diagnosis.

In regard to the history, of course the thing that always occurs to me as I hear these cases read and read them over is that it is difficult to give the proper weight to the symptoms. There is a presenting symptom in this case. The first thing that we hear about is the complaint of restlessness. That perhaps means very little in the average case, but, in view of what we find farther down on reading the history, it is to me very suggestive of the condition which I

have made or expect to make the diagnosis in this case.

Another interesting thing is that he had already been ill twelve days before he came into the hospital. The chief complaint was abdominal pain and constipation. Thinking of it superficially we might say, having gone just that far, that he might possibly have had obstruction; but we see immediately that he did not have obstruction, for two reasons. One is that the abdominal pain was steady. The other is that the pain was in the epigastrium and the upper abdominal region and he lived for seventeen days after the onset. With abdominal pain, even if it were intermittent in character, in that location of the abdomen he would have had small bowel obstruction and therefore would not have survived so long a time. As we read on we find that he did have quite definite constipation, but not obstipation.

So far as the history is concerned we have restlessness. We have pain which is steady in character and is upper abdominal. We have a rather long course. We have a rather sudden onset coming on after what was apparently an upper respiratory infection with a chill. Those things suggest to me more than anything a subacute pancreatitis, perhaps beginning as an acute one, and as it so frequently does, subsiding and following a chronic or subacute course.

As we read along, the past history means very little to me, and I think does not help us in making a diagnosis.

As we come to the physical examination there are two facts about which I should like to know and which are not mentioned in this summary. One is the question of tenderness, which is not mentioned, and the other is the question of peristalsis. Leaving those out we find definitely that the heart and lungs were negative. Of course we might have said before that some of the things that cause chill are pneumonia or urinary tract infection, but those are negative. We find that he has upper abdominal distention, that some observer has felt a mass, or thought he felt a mass, and that another observer said that there was a sense of resistance, all of which might reasonably go with an effusion in the lesser omental cavity as a result of pancreatitis. We know also that he had a low temperature. It was not high except at the end. The pulse was not rapid. The white cell count was elevated, but not very much. I think the distention and the upper abdominal resistance, the question of mass, which was probably there, in my opinion at least, with the low temperature elevation, the rather slow pulse and the relatively low white count, are quite suggestive of the diagnosis of pancreatitis.

I was interested in the fact that they did a barium enema on this man, because it rather indicates that they suspected that he was obstructed, and if so it further substantiates in a somewhat negative way the diagnosis of pancreatitis, inasmuch as pancreatitis is frequently confused with intestinal obstruction. Dr. Reginald Fitz in his original article on pancreatitis says that most of the cases that he saw in consultation were diagnosed as intestinal obstruction.

Of further interest in this case is the subsequent course. He had a sudden episode in his chest. At first I was rather reluctant to explain that on the basis of my thesis that this is pancreatitis, but I think it is reasonable to suppose (and I think Dr. Vincent has seen such cases also) that the pancreatic suppuration may have spread through the diaphragm into the lower part of the chest and pleural cavity. I suppose it might be pneumonia. It might be embolic pneumonia.

I should think it is fair to assume from the description that the terminal event was a pulmonary embolus.

By way of prophesying I think, therefore, that we might put the whole thing together by saying he had an upper respiratory infection. He had a subacute pancreatitis beginning suddenly and subsiding, possibly a hematogenous infection, as I think many of these cases are (I should guess that he did not have gall stones), with possible extension by direct continuity into the chest and a terminal pulmonary embolus which could be secondary to a thrombophlebitis of the splenic vein.

It is rather interesting, if I may take just a minute more, that yesterday in looking through some old books I ran across Dr. Fitz's monograph on pancreatitis. I find in it two statements which tend to corroborate my suggestion that subacute pancreatitis with complications secondary to it would explain the entire clinical picture in this case. They are as follows:

"Thrombosis of the splenic vein frequently accompanies the pancreatic lesion and is usually parietal. The thrombus in the early stages is soft and dark red, or it may be of a reddish-gray color. It has been found partly puriform, and extending to the portal vein at the end of the second week.

"The inflammatory process may be extended to the pleural and pericardial cavities, and an acute leptomeningitis has been found on the thirteenth day. At a late stage of the disease death may result from pulmonary embolism."

Dr. Arlie V. Bock: Try as you will, it is impossible to make a paper case look like the actual clinical picture. I saw this man with the house officers in the Emergency Ward. The question raised by them was whether to admit him to the wards or send him home. He had a history of chill. He was not feeling well, and he had a little indefinite distress in the upper

abdomen, not very marked at any subsequent time. The thing that impressed me was the queer pinched look about his eyes and nose, and the fact that his abdomen had a little generalized distention and felt a little bit doughy. I thought that he had sepsis somewhere and that we had better send him into the ward. In the Emergency Ward he had no fever, but he did have a white cell count of 13,000. I was not impressed with the picture that Dr. Sweet points out, the possibility of pancreatitis, but was unable to say where his sepsis was. The subsequent white cell counts ran 13,000, 14,000, 15,000, up to 20,000. The next evening he had a phlebitis in the right lower leg. Soon after that he inadvertently got out of bed and collapsed. I did not see him until the next morning, when it was perfectly obvious that he could not have anything but a massive pulmonary embolus. What was back of the phlebitis, however, we had no idea.

DR. BENJAMIN CASTLEMAN: Have you any suggestions, Dr. Churchill?

DR. EDWARD D. CHURCHILL: I have no further suggestions about the abdominal condition. It seems that the incident producing the pathology at the base of the right lung is better to be explained as a pulmonary infarction. Given a phlebitis and a terminal pulmonary embolus, the incident between the two, causing pleurisy and a high right diaphragm is more apt to be an infarction of the lung than a totally independent process such as extension of an intra-abdominal process through the diaphragm.

DR. BOCK: The signs in the chest suggested a partial collapse of the right lower lobe, though they were consistent with a small amount of fluid.

DR. CHURCHILL: Was a friction rub heard?

DR. BOCK: No. They came on very quickly and made one think of possible collapse.

The x-ray men are not here to interpret the films.

DR. CASTLEMAN: The X-Ray Department interpreted this as an infectious process at the right base and diaphragmatic pleurisy on the right. The x-ray interpretation of the anteroposterior view of the chest was pleurisy involving the lower lobe.

CLINICAL DIAGNOSES

Pulmonary embolism.
Phlebitis of the right leg.

ANATOMIC DIAGNOSES

Typhlitis, acute and chronic.
Abscess of the liver.
Thrombophlebitis of the right external saphenous vein.
Pulmonary atelectasis, right middle and lower and left lower lobes.
Pulmonary embolism, bilateral.
Infarct of lung, right lower lobe.
Solitary cyst of kidney.

PATHOLOGIC DISCUSSION

DR. CASTLEMAN: The autopsy showed that the terminal event was an embolus coming from a thrombus in the external saphenous vein.

The shadow in the chest turned out to be a fairly large infarct of the right lower lobe, about 4 centimeters in diameter. It was in the peripheral portion of the lung, but did not produce any pleurisy. The infarct looked about a day or two old and was not the terminal event. He had on top of that, as Dr. Churchill suggested, a second embolus located at the bifurcation of the pulmonary artery. This undoubtedly caused his death.

The cause of the abdominal symptoms was found in a liver abscess about 8 by 4 by 4 centimeters in the center of the right lobe. At first we could not find the etiology of the liver abscess, but upon examining the cecum and appendix we found at the base of the appendix in the cecum a slight inflammatory condition which apparently was fairly old, probably a week or two. On dissection the ileocolic veins and all the veins up through the portal system, including the intrahepatic portal veins, were negative. One would have to assume that some infection had gone on in the cecum at one time and had started the abscess, although at the time of autopsy one could not find any acute evidence of typhlitis.

The microscopic section of the abscess does not show anything specific. The ordinary cause of a single abscess is the entameba histolytica, but we could not find any signs of that. A section of the wall however showed marked inflammatory reaction in the portal canals, in the wall of the portal vein, and the small portal radicles, but nothing at all inside the portal vein. One occasionally sees or hears about actinomycotic infection of the cecum producing a single liver abscess, but the ordinary abscesses in the liver are usually multiple. In this case we found only a single abscess.

He had no pancreatitis and the splenic veins and radicles were negative.

DR. BOCK: Could you guess how long he had the liver abscess?

DR. CASTLEMAN: It was well walled off; it must have been at least three weeks old, in the neighborhood of weeks anyhow.

DR. CHURCHILL: Did the abscess present on the diaphragmatic surface?

DR. CASTLEMAN: No. It was right in the center of the lobe. In fact we did not know it was there until we cut into the liver.

DR. BOCK: This is an extraordinarily interesting case, because we should have been able

to make a definite diagnosis of liver abscess before death. When they have this high fixed diaphragm and atelectasis of the lower lobe almost inevitably it is due to subphrenic extension. Here you have proved, however, that it came from embolus. It gives exactly the same fixation of the diaphragm.

DR. TORR W. HARMER: Did this man have any chills?

DR. CASTLEMAN: That was his first symptom; but he had none after that.

DR. BOCK: We did not consider him a mortally ill man at all.

DR. HARMER: I have heard of a very similar autopsy within a couple of weeks, a man who had inflammation of his appendix. He was seen by a couple of good observers, who thought it was not appendicitis. Then occurred a series of chills, and a diagnosis of liver infection was made. Curiously enough, some of these chills were followed by high temperature and others were not. Those followed by temperature showed a leukocytosis and those that were not showed a low white cell count. That was consistent all through. That man had a huge liver abscess.

Two years ago I saw a young man who had had an appendectomy. I made a diagnosis of liver abscess, high diaphragm on the right but not splinted, high temperature. At operation I found a single abscess two and one half inches in diameter situated in the right lobe one inch from the anterior surface of the liver. It was drained and the man recovered. In this case several white blood cell counts before operation were about 27,000.

DR. CASTLEMAN: Dr. A. W. Allen has always emphasized the point that if a man has a chill before an attack of appendicitis it usually turns into a pylephlebitis.

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REPORT ON BREAST TUMORS

ACCORDING to *Cancer Clinic Bulletin* Number 15, issued this month by the Massachusetts Department of Public Health, the California State Medical Society, through its Cancer Commission, is making a definite contribution by issuing carefully prepared reports on various aspects of the cancer problem. The first report, considering the subject of breast tumors, was published by the American Society for the Control of Cancer and reproduced in the *Massachusetts Cancer Clinic Bulletin*.

This report, representing the composite opinions of the Commission, takes up breast cancer under various headings. The attention of the patient is first drawn to the breast by a painless lump or a bleeding nipple, either of which signs requires careful examination. Women should be educated to keep watch of their breasts and not wait for accidental discovery. A non-bloody nipple discharge is not ordinarily diagnostic of malignancy.

Proper examination should include a complete history, with special reference to the breast, including pregnancies, miscarriages, incomplete or abnormal lactations, infections and traumata, a general physical examination, a careful inspection, noting asymmetry, dimpling or pigmentation, visible local swelling and retraction of the nipple, and palpation. In palpation extreme gentleness is imperative lest cancer cells be forced out into lymphatic channels, and should be done with the flat of the hand. The results of transillumination should be considered as confirmatory and not diagnostic.

In the presence of definite breast tumors the committee recommends chest x-rays to rule out lung metastases, and further x-rays to include spine and pelvis if the so-called "rheumatic pains" are present.

The statement is made axiomatically that every gross nodule present in the breast in a patient over the age of twenty-five years should be explored, unless the diagnosis of cancer is obvious. Preliminary radiation before exploration was advised by two members of the commission, and it was recommended that, in making a biopsy, the consent of the patient should be obtained and complete preparation made for further surgery if found to be necessary.

In determining proper treatment, the lesions requiring local removal were classified as the encapsulated tumors, such as encapsulated adenoma or adenofibroma, single serous and papillomatous cysts, cystadenoma, either encapsulated or localized, and tumor-like masses of chronic cystic mastitis. The breast only should be removed in case of diffuse polycystic and fibrocystic mastitis, tuberculosis, Paget's disease of the nipple, or any chronic, intractable nipple eczema, and, for palliative purposes, any large ulcerating mass as the result of necrosis from malignancy. The requirements of the minimum adequate radical operation are also set forth, as are the uses and limitations of radiotherapy.

This useful bulletin is another indication of the great interest being taken in cancer, and also of the fact that earlier diagnosis and better treatment are being widely instituted.

MADAME CURIE

ON July 4, at Sallanches, France, died the woman who might justly have been called, during her life, the world's most renowned scientist. A chemist, of Polish birth, Madame Marie Curie made undoubtedly the greatest contributions to medicine since the discoveries of her fellow chemist, Louis Pasteur.

Madame Curie was born Marie Sklodowska in Warsaw, Poland, on November 7, 1867, the daughter of the professor of mathematics and physics in the University of Warsaw. In 1895, having moved to Paris to study for her doctorate, she married Pierre Curie, a fellow scientist, and continued working with him. In 1898 they announced their joint discovery of the rare elements polonium and radium, which they had obtained from pitchblende.

In 1903 the Curies received together the Nobel Prize for Physics, and in 1911 Madame Curie received it for chemistry—the first person ever to receive it twice. In 1903 they received together the Davy Medal of the Royal Society. After M. Curie's tragic death in 1906 Madame Curie continued their studies alone, avoiding the public view despite the honors which were constantly being bestowed upon her. In 1919 a gram of radium, valued at $100,000, was presented to Madame Curie by the people of the United States, and in 1929 she received from them the money with which to purchase another gram, the presentation being made by President Hoover.

Her life has carried out the instructions which her husband once wrote to a friend to "make life a dream, make dreaming a reality".

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

BOONE, JOHN A. M.D. Harvard University Medical School 1933. House Officer, Children's Medical Department, Massachusetts General Hospital. His subject is "A Case of Hyperinsulinism Without Demonstrable Pancreatic Changes in an Eleven Year Old Child." Page 49. Address: Horlingen, Texas.

EDWARDS, JOSEPH C. A.B., M.D. Harvard University Medical School 1934. Interne, Springfield Hospital. Address: Springfield Hospital, Springfield, Massachusetts. Associated with him is

WHITE, PAUL D. A.B., M.D. Harvard University Medical School 1911. Assistant Professor, Harvard Medical School. Physician, Massachusetts General Hospital. Address: Massachusetts General Hospital, Boston, Massachusetts. Their subject is "A Note on the Incidence of Neurocirculatory Asthenia With and Without Organic Heart Disease." Page 53.

BURNETT, JOSEPH H. A.B., M.D. Harvard University Medical School 1919. F.A.C.S. Assistant Visiting Surgeon, Boston City Hospital. Instructor in Surgery, Boston University School of Medicine. His subject is "Fracture of the (Navicular) Carpal Scaphoid." Page 56. Address: 520 Commonwealth Avenue, Boston, Massachusetts.

HURXTHAL, LEWIS M. M.D. Harvard University Medical School 1923. Senior Physician, Medical Department, Lahey Clinic. His subject is "Heart Disease." Page 61. Address: 605 Commonwealth Avenue, Boston, Massachusetts.

THURMON, FRANCIS M. B.S., M.D. Harvard University Medical School 1926. Assistant Professor of Dermatology, Tufts College Medical School. Physician-in-Chief, Clinic of Dermatology and Syphilology, The Boston Dispensary. Consultant in Dermatology, Boston Floating Hospital. Address: 520 Commonwealth Avenue, Boston, Massachusetts. Associated with him is

KORETSKY, LEO. A.B., M.D. Jefferson Medical College 1933. Interne, Springfield Hospital. Address: Springfield Hospital, Springfield, Massachusetts. Their subject is "A Study of One Hundred and Seven Cases of Early Syphilis." Page 65.

BURNETT, FRANCIS L. S.B., M.D. Harvard University Medical School 1906. Director of Health Class for Psoriasis, Massachusetts General Hospital. Director of Health Class for Arthritis, Peter Bent Brigham Hospital. His subject is "The Progress of Nutrition." Page 68. Address: 205 Beacon Street, Boston, Massachusetts.

MISCELLANY

PROVISIONAL FIGURES FOR LIVE BIRTHS, INFANT MORTALITY, AND STILLBIRTHS, IN CONTINENTAL UNITED STATES: 1933

The Bureau of the Census announces that in continental United States, during the calendar year 1933, there were 2,064,944 births, 120,199 deaths of infants under one year of age, and 76,837 stillbirths. These figures represent a birth rate of 16.4 per 1,000 population, an infant mortality rate of 58.2 per 1,000 live births, and a stillbirth rate of 3.7 per 100 live births. In 1932 the corresponding rates for the birth registration area, which did not then include Texas, were 17.4, 57.6, and 3.8. The birth rate for 1933 is the lowest reported since the Federal birth registration area was established in 1915, when it included only 10 states and the District of Columbia. The area has been gradually extended since then by the inclusion of other states until, with the admission of Texas in 1933, it included for the first time the entire area for the continental United States.

New York, Pennsylvania, Texas, and Illinois lead the states with the greatest number of births, respectively, as follows: 187,139; 157,046; 107,924; and 106,861. The States with the highest birth rates per 1,000 population, however, are New Mexico, 26.7; North Carolina and Utah, each 22.9; South Carolina, 22.7; Mississippi, 21.6; Alabama, 21.1; and Virginia, 21.0—all Southern States except Utah, and all largely rural. The lowest birth rates are for Oregon, 12.2 and California, 12.4.

Infant mortality rates, which are based on the number of deaths of infants under one year of age per 1,000 live births, are excessively high in New Mexico (134.2), and Arizona (111.4) — both States with large nomadic Indian and Mexican populations which have little knowledge of infant care. The

next highest rate is 78.4 for South Carolina — a Southern State with a large Negro population. The lowest rates reported are those for Washington and Oregon, 38.9 and 39.3, respectively.

The ratio of stillbirths per 100 live births was 3.7 for the United States. Comparison between the states as regards this ratio should be made with caution, as there is no single definition of stillbirths in general use and the application of the term varies widely in the law and practices of the different states. — *Department of Commerce, Bureau of the Census, Washington.*

ARMY NEEDS MEDICAL MEN

The waiting list of accepted candidates for commissions in the Army Medical Corps has been so depleted that the War Department will hold examinations in various parts of the country, it was said July 8, at the Army Building, 39 Whitehall Street. Local boards will examine physicians in civil life for commissions on September 24-28, and dentists will be examined October 1-5, it was announced. Examinations for the Veterinary Corps will be held October 8-12.—*New York Times.*

CORRESPONDENCE

THE PERIODIC HEALTH EXAMINATION

July 3, 1934.

Editor, *New England Journal of Medicine,*

Such opinions regarding the periodic health examination as those expressed by Dr. Shattuck in his letter in the last issue of the *Journal* are much appreciated by the Committee on Public Health. The purpose of our communication to which Dr. Shattuck refers was to bring about discussion of the subject, before embarking upon any further publicity in the name of the Massachusetts Medical Society. Unless the Fellows of the Society can agree upon the wisdom of further publicity it will be harmful.

Recently there came to my attention a copy of "Rules and Regulations of the Middlesex Medical Association" adopted in 1813. One hundred and twenty years later the following quotation is pertinent: "The differences of physicians, when they end in appeals to the publick, generally hurt the contending parties; but what is of more consequence, they discredit the profession, and expose the faculty to contempt and ridicule."

If there are "differences of physicians" on the question of periodic health examinations, official health agencies and lay groups must promote the subject with caution. The motive of the committee was to proceed with such caution — not to be destructive or reactionary. Criticism is welcome.

Very truly yours,

DWIGHT O'HARA, M.D., *Chairman,*
Committee on Public Health.

A TRIBUTE TO DR. POST

July 6, 1934.

Editor, *New England Journal of Medicine,*

I was very much interested in your excellent obituary of Dr. Abner Post and regard your remarks on his surgical ability as eminently fair. Dr. Post's eminence as a syphilographer has brought it about that his excellence as a surgeon is rather put into the shade. I had the pleasure of being associated with him during my early years at the Boston City Hospital and had good reason to appreciate his wonderful powers of observation. No sign or symptom however inconspicuous, whether or not connected with the lesion, escaped him, a faculty which sometimes enabled him to make diagnoses which were almost uncanny. During those early years, cases of appendicitis seldom came to our attention before suppuration, and one could learn more by watching Dr. Post deal with these cases of appendix abscesses than any of the older surgeons at the hospital. He was also extremely proficient in the treatment of compound fractures. He used to do what we now call "Débridement." He got them clean and usually put them up in plaster. I well remember how quickly his patients with compound fractures got well and how good his results were. He was a sensitive man, and modest. One had to ask him for his opinion before he would give it. I well remember the clinical meetings at the City Hospital which were started at his instigation, and how gracefully he presided, and how well attended and how interesting those meetings were. I want to add my testimony to the appreciation of his surgical work which you showed in your obituary.

With best regards, I remain,

Yours very truly,

F. B. LUND, M.D.

EDITORIAL NOTE: The obituary was written by a physician selected by the daughter of Dr. Post. This gentleman was a personal friend of Dr. Post.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,

July 3, 1934.

Editor, The *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of May 31 the following have been accepted:

Abbott Laboratories

Mixed Ragweed Pollen Extract Decimal Dilution Set

Mallinckrodt Chemical Works

Hippuran

Hippuran (Crystals) 12 Gm. vial

Sterile Solution Hippuran 25 cc. size

Wm. S. Merrell Company
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Diothane 10% Solution

Parke, Davis & Co.
Ampoules Thio-Bismol, 2 Gm.
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Carotene—SMACO
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SMACO Carotene with Vitamin D Concentrate in Oil
SMACO Vitamin D Concentrate in Oil
SMACO Carotene and Vitamin D Concentrate in Cod Liver Oil

Winthrop Chemical Co., Inc.
Diodrast
Diodrast Sterile Solution (35 per cent, weight/volume), 10 cc. size
Diodrast Sterile Solution (35 per cent, weight/volume), 20 cc. size

The following product has been accepted for inclusion in the List of Articles and Brands Accepted by the Council But Not Described in N.N.R.:

Stevenson's Mineral Oil Co.
Stevenson's Heavy Russian Mineral Oil (Mint Flavored)

Yours very truly,
PAUL NICHOLAS LEECH, *Secretary.*
Council on Pharmacy and Chemistry.

RECENT DEATHS

FENNESSEY—WILLIAM CASEY FENNESSEY, M.D., of 599 Tremont Street, Boston, died June 22, 1934, at his summer home at Buzzards Bay, Massachusetts.

He was born in 1877, graduated in medicine from the Middlesex College of Medicine and Surgery in 1915, and joined the Massachusetts Medical Society in 1932.

He was a member of the South End Medical Club, St. Luke's Guild, Norfolk Court, M. C. O. F., and Mt. Bowdoin Council, K. of C.

O'CONNOR — JOHN HENRY O'CONNOR, M.D., of 26 Oak Street, Hyde Park, Massachusetts, died at his home, July 7, 1934.

He was born in Chelmsford in 1869, attended St. Patrick's Parochial School in Lowell, and graduated from Holy Cross College in 1892. His medical degree was conferred by the Harvard Medical School in 1896. He settled in Hyde Park, and acquired a successful practice. He joined the Massachusetts Medical Society in 1896, and was a Fellow of the American Medical Association. He was a member of the James J. Chittick Lodge, K. of C., and the Holy Name Society.

He is survived by his widow, Mrs. Louise O'Connor.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

July 24-31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schniz. General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich.

August 18 - September 30—Medical Study Trip to Hungary. See page 975, issue of May 10.

September 3-6—American Public Health Association, at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis. For information address the National Tuberculosis Association, 450 Seventh Avenue, New York City.

September 10, 11, 12, and 13—American Congress on Physical Therapy will meet in Philadelphia at the Bellevue Stratford. For details write American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

September 10-15—First International Congress of Electro-Radio-Biology will be held in the Doges Palace at Venice. For details address the General Secretary of the Congress, Dr. Giocondo Protti, S. Gregorio 173, Venice (Italy).

September 27 and 28—International Association for Preventive Pediatrics will be held at Lyons. For details address the Secretary of the I. A. P. P., 15 rue Lévrier, Geneva (Switzerland).

September 28-29—New England Surgical Society will meet at Burlington, Vermont. For details address the Secretary, Dr. John M. Birnie, 14 Chestnut Street, Springfield, Mass.

October 22 - November 2—1934 Graduate Fortnight of the New York Academy of Medicine. See page 1240, issue of June 7.

October 31 - November 2—Massachusetts State Nurses' Association, Hotel Statler, Boston. For information write Miss Helene G. Lee, R.N., 420 Boylston Street, Boston.

April 29 - May 3, 1935—The American College of Physicians will meet in Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

June, 1935—Medical Library Association will meet in Rochester, N. Y. For details address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

BOOKS RECEIVED FOR REVIEW

The Cyclopedia of Medicine. By George Morris Piersol, Editor-in-Chief, and Edward L. Bortz, Assistant Editor. Volumes VIII and IX. 1933. Philadelphia: F. A. Davis Company. Twelve volumes and desk index (Terms if desired.) $112.00. Handsomely bound in dark-green De Luxe Fabrikoid, Morocco Grained and Gold Stamped. Flexible or Standard Binding Optional.

The Essentials of Physical Diagnosis. By Robert W. Buck. 259 pp. Philadelphia and London: W. B. Saunders Company. $3.00.

Modern Clinical Syphilology; Diagnosis, Treatment, Case Studies. By John H. Stokes. Second Edition. 1400 pp., 973 illustrations. Philadelphia and London: W. B. Saunders Company. $12.00.

Traité de Physiologie Normale et Pathologique. Publié sous la direction de G. H. Roger et Léon Binet. Tome VII. Sang et Lymphe Réactions d'Immunité. Deuxième Édition. Par MM. Achard, Justin-Besançon, et al. 730 pp. Paris: Masson et Cie. 100 fr.

A Text-Book of Pharmacology and Therapeutics or the Action of Drugs in Health and Disease. By Arthur R. Cushny. Tenth Edition. 786 pp. Philadelphia: Lea & Febiger. $6.50.

The International Medical Annual. A year book of treatment and practitioner's index. Edited by

H. Letheby Tidy and A. Rendle Short. Fifty-Second Year, 1934. 579 pp. Baltimore: William Wood and Company. $6.00.

Collected Papers of The Mayo Clinic and The Mayo Foundation. Edited by Maud H. Mellish-Wilson, and Richard M. Hewitt. Volume XXV, 1933. Published May, 1934. 1230 pp. Philadelphia: W. B. Saunders Company. Cloth, $11.50 net.

One Hour of Medical History. By Benjamin Spector. Volume III. 181 pp. Tufts College Medical School. Boston: The Beacon Press, Inc.

Précis de Sémiologie Médicale Appliquée. Par M. Chiray et P. Chêne. 603 pp. Paris: Masson et Cie, 1934. 75 fr.

Thérapeutique Hydro-Climatologique des Maladies du Rein et des Voies Urinaires. Par A. Lemierre et L. Justin-Besançon. 138 pp. Paris: Masson et Cie, 1934. 20 fr.

Thérapeutique Hydro-Climatologique de la Tuberculose. Par Léon Bernard et Roger Even. 144 pp. Paris: Masson et Cie, 1934. 20 fr.

Thérapeutique Hydro-Climatique des Maladies non Tuberculeuses de l'Appareil Respiratoire. Par M. Piery. 155 pp. Paris: Masson et Cie, 1934. 20 fr.

Thérapeutique Médicale. VII. Vaisseaux et Reins. Par M. Loeper. 340 pp. Paris: Masson et Cie, 1934. 50 fr.

The Medical and Orthopaedic Management of Chronic Arthritis. By Ralph Pemberton and Robert B. Osgood. 403 pp. New York: The Macmillan Company. $5.00.

Problèmes Actuels de Pathologie Médicale. Troisième Série. Par A. Clerc. 338 pp. Paris: Masson et Cie. 45 fr.

Les Traitements de l'Hypertension Artérielle. Par Maurice Roch. 148 pp. Paris: Masson et Cie. 20 fr.

Cours Elementaire de Dessin d'Anatomie du Squelette. Par A. Moreaux. 44 pp. Paris: Masson et Cie. 10 fr.

Annals of Roentgenology. A series of monographic atlases. Edited by James T. Case. Volume Sixteen. **Foreign Body in Air and Food Passages.** By Chevalier Jackson and Chevalier L. Jackson. 265 pp. New York: Paul B. Hoeber, Inc. $12.00.

BOOK REVIEWS

Mental Deficiency Nursing (Simplified). By O. P. Napier Pearn. 281 pp. Baltimore: William Wood and Company. $2.00.

This small, compact book is a brief review of the subject of deficiency nursing in hospitals for mental defectives. It is well written and appears to be accurate. Much of importance and value to a nurse is included and such a book can be highly recommended for use as it was intended. It is not, however, a book for medical students or physicians. As the material was gathered together at an English hospital for mental deficiency, one finds a few rules and regulations that might not apply to an American institution. This is particularly so in the final chapter on "The Mental Defective and the Law." One would expect, however, that in spite of this, such a book would be useful in this country.

The Chances of Morbid Inheritance. Edited by C. P. Blacker. 449 pp. Baltimore: William Wood and Company, 1934. $5.00.

This is an excellent book on a specialized topic. A group of investigators have written chapters, all of very high quality, on such diseases as hereditary nervous disorders, epilepsy, mental deficiency, diseases of the eye, ear, blood, cardiovascular and renal systems, skin, gastro-intestinal tract, allergic diseases, diabetes mellitus, tuberculosis, and neoplastic disease. There is a general introduction on genetic principles, a glossary of terms, schedule for recording pathological pedigrees, and an excellent index.

The aim of this book is to supply the general practitioner with the means of dealing with requests for "eugenic prognoses;" in other words, to give him a background for estimating the probability of a common disease or defect being inherited. As such requests are made with increasing frequency, resulting from the widespread knowledge of eugenics by the public, this book is extremely timely. Each chapter is written in simple, clear language, with a final summary, under all the diseases considered, as to the chances of inheritance. There are numerous charts and diagrams and an excellent list of references after each chapter.

One feels that this book is an outstanding contribution to the subject and should have a widespread influence. Although written and printed in England, the authors pay splendid tribute to the work done in other countries and no literature of importance seems to have been omitted. Rarely does one find a book, written by various authors, which maintains such a high degree of excellence throughout all its chapters.

Modern Clinical Syphilology; Diagnosis, Treatment, Case Studies. By John H. Stokes. Second edition. 1400 pp., 973 illustrations. Philadelphia and London: W. B. Saunders Company. $12.00.

In this second edition the author has completely rewritten fifteen of his original twenty-three chapters and added a new one on Relapse, Reinfection, and Progression in Early Syphilis. In bringing his former edition up-to-date, he has kept in mind the objectives of his earlier work, in spite of the addition of much material necessitated by the advance in world literature on the subject, new evaluation of drugs, new physical methods and laboratory tests. He has utilized the experience of his added ten years in private practice, and the conclusions of such working units as the Coöperative Clinical Group and the United States Public Health Service.

He has developed in detail his chapter on prenatal and familial syphilis and has added full and

forceful discussion on the public health phase of the work, the control of infectiousness, and the protection of the physician himself.

The plan of throwing certain sections primarily intended for the expert into smaller type makes it possible for the book to serve admirably as textbook for the student, guide for the general practitioner, and at the same time an informative reference for the experienced. It has been increased in size by approximately 250 pages and 100 illustrations.

Bright's Disease. A clinical handbook for practitioners and senior students. By J. Norman Cruickshank. 208 pp. Baltimore: William Wood & Company. $3.75.

This short monograph is splendidly written. While not an exhaustive treatise on the subject, the author stresses the clinical and pathologic aspects of the disease. Recent experimental work, and some newer biological tests are described, but not in detail. The book is intended for practitioners who have little time to scan the recent literature. The clinical and pathological types of the disease are adequately and fully reviewed, and one chapter each is devoted to etiology, treatment, renal function tests, edema, and uremia. Part two of the appendix contains Russell's, Van Slyke and Addis', and Muir's classification of this malady.

A Text-Book of Pharmacology and Therapeutics or the Action of Drugs in Health and Disease. By Arthur R. Cushny. Tenth Edition. 786 pp. Philadelphia: Lea & Febiger. $6.50.

This tenth edition of a justly famous and authoritative textbook of pharmacology differs but little from its predecessors which medical students have learned to love and to hate for some thirty years—this despite some excellent revision by Professors Edmunds of Ann Arbor and Gunn of Oxford. Cushny's Pharmacology is without doubt the standard English text in pharmacology, but it retains for the reviewer the same dull, stodgy flavor which it possessed when he was underlining its pages some fourteen years ago. As a didactic textbook which duly records the pharmacological actions of the various drugs it is unexcelled, but despite its recent revision, it does not effectively bridge the gap between the science of pharmacology and the art of therapeutics. The more distinctly American text of Sollman is much more successful in this respect and, for the active practitioner, this volume or an even more practical one such as Beckman's "Treatment in General Practice" is to be recommended.

Professor Edmunds has added some new material on liver and stomach preparations and on the vitamins, and the section on iron has been thoroughly and excellently revised in line with modern practice.

This book is a good one for conscientious medical students and will probably continue in use for many more years. It cannot, however, be recommended for the practitioner who, after all, is the pharmacologist to the very human patients with whom he comes in contact.

The Principles of Gynaecology. A text-book for students and practitioners. By William Blair-Bell. Fourth Edition. 848 pp. Baltimore: William Wood and Company. $10.00.

The first edition of this admirable standard textbook of Gynaecology for students and practitioners appeared in 1910 and with subsequent editions has been favorably reviewed in the *Journal*. In the original edition the author adopted an arrangement of material different from that which had hitherto been customary, thereby obtaining a distinctive advantage in lucidity and ease of reading. In the revision and rewriting of this fourth edition he has been assisted by M. M. Datnow, M.D., and by Arthur C. H. Bell, M.B. The portions dealing with the physiology of internal secretions, endometrial and ovarian neoplasms, and the treatment of malignant disease, have been almost entirely rewritten in the light of recent progress. New sections have been added on the history of gynaecology and on ethical and medico-legal questions. Important and considerable additions, alterations, and improvements have been made throughout the text and more than one hundred new illustrations including many color plates have been added. It is significant that the author recognizes the inseparability of gynaecology and obstetrics. In discussing the sociological problem of contraception, to which he grants a legitimate place in medicine, he makes the important observation "that widespread interference with biological processes is always dangerous and may lead to destruction rather than salvation."

The book is provided with an appendix of useful tables and an admirable and adequate index. The work should maintain its established position of value as an examplar of British teaching and practice of gynaecology.

Die Parasagittalen Meningeome. By H. Olivecrona. 144 pp. Leipzig: Georg Thieme, 1934. 26 marks.

The book at hand is an excellent monograph on a single type of brain tumor, occurring in a localized region of the cranium. Although meningiomas occur frequently elsewhere in the body, one of their favorite sites is along the longitudinal sinus. As meningiomas, in general, form ten to fifteen per cent of all brain tumors and as the localization in this region is more favorable for operative removal than in many other regions, one welcomes a book on this rather highly specialized topic. Dr. Olivecrona of Stockholm, who is well known in this country, has reviewed the whole subject with great care and his monograph covers not only the clinical and diagnostic aspects of the disease but also the pathology and the operative technique of removal. There are

many splendid illustrations of x-rays, pathological material and diagrams. The publication is up to the standard of the finest type of German medical monograph and it is a pleasure to review a book of this type. The importance of monographs on various divisions of a specialized part of medicine, such as neurosurgery, need not be reëmphasized. This is, without doubt, one of the best contributions of its type that has come to hand for many years.

Acute Intestinal Obstruction. By Monroe A. McIver. 430 pp. Cambridge: Harvard University Press. $2.50.

This monograph, the result of a decade of careful study of the physiologic and clinical aspects of intestinal obstruction, is so important that it should be studied rather than read by every physician having to do with the diagnosis or treatment of abdominal diseases. The author began his work in the wards of the Massachusetts General Hospital and in the Surgical Laboratory of the hospital and the Harvard Medical School. He considers this very complicated subject from all possible aspects and discusses not only the findings of his own observations in the clinic and in the laboratory, but those of all other important contributors to the subject during the last century. At the end of every chapter is an extensive and very accurate bibliography. Definite suggestions for the management of these conditions at all stages are made, these suggestions being based properly on physiological and pathological indications. In the discussion of the controversy as to the cause or causes of death in uncomplicated obstruction, a very sane point of view is taken. The objections to the various experiments leading to the belief that a toxic factor is important are pointed out and one is left with the conclusion that in this form of obstruction dehydration plays a much greater part. One cannot select the section on Surgical Treatment, for instance, and say that it is outstanding in respect to other parts of the book. The whole book is outstanding and cannot be too highly recommended.

Mental Hygiene in the Community. By Clara Bassett. 394 pp. New York: The Macmillan Company. $3.50.

Approximately twenty-five years ago a movement was started which had as its principal object an improvement in the care of the insane. The leadership in this movement was soon concentrated in the National Committee for Mental Hygiene of New York City. This book may be taken as representing the high tide of the mental hygiene movement.

In the introductory chapter the scope of the movement is set forth, in many cases by quotations from various leaders in the field. Mental hygiene is defined, "an art or practice, in application of the facts, laws and principles found or enunciated by the science, to human individuals and the various fields of human activity or endeavor". It is to be applied in or to the following institutions or organizations: the home, school, industry, penal and reform institutions, hospitals, church, peoples and nations. The persons by and to whom the principles need to be applied are the following: parents, children, teachers, employers and managers, employees, physicians, clergymen, judges, and the public in general. It almost seems as though time might have been saved by simply stating that it should be applied to everybody everywhere.

"The goal of mental hygiene is mental health" which is described as follows: "Mental health . . . is the adjustment of human beings to themselves and the world at large with a maximum of personal and social effectiveness and satisfactions," etc. The author modestly admits that, "Mental hygiene has not yet reached the stage of scientific precision which will enable it to offer concrete, effective solutions for the many complex problems of personality which it has undertaken to study. It is by no means completely equipped for unqualified success in the treatment of any or all of the possible disorders hereafter described. From the standpoint of pure science, mental hygiene is hardly out of its swaddling clothes and many more decades of research and experimentation will be necessary before such a happy consummation will be achieved." Later, "In spite of this dash of cold water on overheated hopes and enthusiasms, the mental hygiene approach has proved even in its immature state so much more penetrating, stimulating and fruitful than any previous mode of attack on baffling individual and social problems that its further widespread utilization is thoroughly warranted. Since almost all external schemes of social redemption have more or less conspicuously and expensively failed, it is the part of wisdom to see what contribution can be made through the study, understanding and control of those inner psychological forces and motivations which are now thought to determine to a very large degree individual and social behavior."

In other words, mental hygiene is a scheme for social redemption. After so many years of doubt it is wonderful to have so concrete a definition.

The author next proceeds to take up categorically practically all of the ills of society from original sin to highway robbery. First the field of medicine and its relation to mental hygiene is analyzed. The relation between mental disease and mental hygiene is set forth and the various gods of mental hygiene are quoted extensively to show the need of a greater extension of psychiatric facilities and a greater understanding of mental hygiene principles by practicing doctors. The need of increased time for psychiatry in medical schools is stressed.

Next the field of nursing is surveyed. Here again much is to be done to give the nurses greater insight as to their problems.

Then the field of social service is reviewed showing again many needs and opportunities.

Now comes the chapter on mental hygiene, delinquency and the law. This is familiar territory, for since the beginning of time the shortcomings of lawyers have been set forth. The curriculum of the law school is studied at some length showing what a barren start future barristers have in so far as formal instruction is concerned. The evil effect of this is shown to be widespread. In fact, the personnel of Congress and governmental agencies is analyzed showing the overwhelming preponderance of persons of legal training, all of them quite uninitiated in so far as mental hygiene principles are concerned. Little wonder the world is badly governed!

Parents are said to need greater wisdom in bringing up their children and of course the dilemma of the preschool child is adequately set forth. Upon entering school one might expect something better and yet the educational system and the training of teachers are quite severely arraigned with suggestions, of course, for more mental hygiene.

One might suppose that the theologian would escape since his mission is so kindly and so benevolent, but here again we find gross defects. How could one expect wisdom in mental hygiene matters to come to a theologian when his training consists of "Semitic Philology, 3 courses; New Testament, 9 courses; Apologetics and Christian Ethics, 4 courses; Practical Theology and Homiletics, 25 courses; Old Testament, 13 courses; Church History, 9 courses; Systematic Theology, 7 courses; History of Religion and Missions, 10 courses." One cannot but wonder, however, whether the mental hygienists have accustomed themselves to good preaching.

Much work has been done in the field of industry as shown by Chapter Ten. Even recreation can be made more hygienic if its leaders will but follow the leads set forth in this book.

The final chapter, "Mental Hygiene and Psychiatric Institutions and Agencies," gives a review of the various organized efforts in the field.

How shall we appraise this book? There are those who believe that mental hygiene is a medical specialty limited in its scope to those illnesses whose symptoms indicate mental disorder. This is not the attitude of the author of this book. Of the twelve chapters, but one concerns itself directly with medicine. From this point on the whole range of human ills, moral and social, is covered. The various departments of human affairs are covered categorically indicating in a general way the failure of society to avail itself of later-day findings and methods. A tremendous amount of information has been amassed. Nearly four hundred pages are devoted to picking to pieces social orthodoxy. Little wonder that the true mental hygienists object to being confined to a medical specialty when there is so much to be done in the world. One is amazed at the scope covered. Is it possible that the wise men of the generations have been so lacking in wisdom and that society has advanced so sluggishly prior to the advent of mental hygiene? The programs laid out for future improvement seem to indicate the attitude of a perfectionist.

Finally, while going over the pages of this book the reader unconsciously comes to realize that it is after all the expression of zealous striving for better things. It is an expression of practical idealism. Perhaps the greatest contribution of psychiatry has been after all a tremendous humanizing and socializing influence.

On the whole, an excellent book, perhaps for the first time bringing together all the pretensions of mental hygiene in one volume.

Child Guidance Clinics. A Quarter-Century of Development. By George S. Stevenson and Geddes Smith. 185 pp. New York: The Commonwealth Fund. $1.50.

This survey of the history of the "Child Guidance" movement and attempted appraisal of its present status will be carefully studied by social workers and by teachers. Very few doctors will even glance at it, yet no doctor who sees children or discusses their problems should ignore this volume. Dr. Stevenson and Mr. Smith offer a clear and frank statement about a series of carefully planned and adequately carried out medical experiments.

Admittedly the child guidance clinic is expensive; it cannot be, or at least is not, self-supporting and workers in it cannot do their best unless they feel reasonably secure. From every point of view the doctors of a community should inform themselves about these very interesting and important enterprises. As an introduction this small volume is adequate.

Medical attention is peculiarly desirable at this time, because it is generally believed that the form, and to some extent the aim, of these clinics, will depend upon the degree to which the medical profession is willing to try to understand an enterprise which has educational and social, as well as "medical" responsibilities.

Demonstrations of Physical Signs in Clinical Surgery. By Hamilton Bailey. Fourth Edition. 287 pp. Baltimore: William Wood and Company. $6.50.

This book of two hundred and seventy-two pages, quite condensed and very fully illustrated, contains some information useful to the medical student or practitioner. On the whole it is only fair. There are places where the reviewer thinks somewhat more detail might be of help. There is one page, and one page only, that is thoroughly bad and that is the last page in the book which is a separate chapter devoted to "Some Signs to Confirm a Suspicion of Neurosis." There are four signs given: (1) exaggerated knee-jerks, (2) absence of gagging on touching the soft palate, (3) absence of corneal reflexes, and (4) dermatographia. The reviewer cannot believe that these signs are of the slightest

value in this diagnosis. Occasionally in other parts of the book, signs are described which have not received the test of time and general acceptance. For instance, in the examination for acute pancreatitis a mydriatic test is described. This test is credited to Loewi by name, but no reference is given.

The Harvey Lectures. Delivered under the auspices of The Harvey Society of New York. 1932-1933. Series XXVIII. 233 pp. Baltimore: Williams & Wilkins Company.

This volume contains eight lectures delivered to the Harvey Society of New York during the season 1932-1933. Dr. Julius Bauer of Vienna discusses constitutional factors in clinical medicine emphasizing genetic influences in some of the endocrine disorders. The Nature of the Menstrual Cycle, by Dr. George W. Corner, and Pituitary Disorders, by Dr. Harvey Cushing, are other papers which have a certain amount of clinical interest. The volume also contains the following articles which would seem to be of more highly specialized or scientific than of general medical interest at the present time:

Similarities between Diseases of the Vegetable Kingdom and those of Man and Animals, by Dr. L. O. Kunkel.

The Oxidation of Hemoglobin and other Respiratory Pigments, by Dr. James B. Conant.

Contributions of Chemistry to the Knowledge of Immune Processes, by Dr. Michael Heidelberger.

Recent Biochemical Studies of Liver Function, by Dr. J. C. Drummond.

Humoral Transmission of Nervous Impulses, by Dr. Otto Loewi.

Citric Acid Determinations and the Presence of Citric Acid in the Human Body. By Anders Lenner. Lund: Hakan Ohlsson, 1934.

From the University Physiological Institute of Lund, Switzerland, comes an elaborate monograph by Lenner representing his experience from investigations on clinical material from the Obstetric and Gynecological Service of Prof. Emil Bovin at Stockholm. This material he has studied with special reference to the relations of citric acid in pregnancy, parturition, and puerperium. The laboratory work of this research was done under the auspices of Dr. Torsten Thunberg at the University of Lund. The research is presented in a series of eight chapters describing the technique of citric acid determination under various conditions and in various clinical aspects. At the close there is a brief summary in German, English, and French. The author believes that there is a relation between temporary melena neonatorum and the citric acid content of the mother's blood, and that the advantage of the addition of citrate in blood transfusions is not merely in prevention of coagulation of the donor's blood, but in the increase of coagulability of the fetal blood. Without necessarily concurring in the author's conclusions, one may recognize that he has presented, in these 325 pages, a large amount of valuable clinical and laboratory research upon an important problem of practical medicine.

Cours Elementaire de Dessin d'Anatomie du Squelette. Par A. Moreaux. 44 pp. Paris: Masson et Cie. 10 fr.

This admirable monograph is intended for medical students, for pupils in fine art, and for all beginners in general who, for professional reasons, wish to enter the practice of anatomical drawing. It consists of a collection of thirty-three exercises designed by an experienced practitioner of anatomical drawing to guide the beginner by offering him a method of work. The bones selected for these exercises are the scapula, humerus, ulna, radius, carpus, metacarpus, phalanges, femur, tibia, fibula, tarsus, metatarsus, innominate, pelvis, sacrum, skull, vertebra, vertebral column, thorax, clavicle and sternum. In each exercise the student begins with a simple preliminary linear construction, which serves as a point of departure and preparation for the final execution, in which details are added from memory or from direct observation. The method is extremely ingenious and furnishes a technique whereby accurate anatomical design of the bones may be readily learned and practiced by the student, he teacher, or the artist.

Annals of the Pickett-Thomson Research Laboratory. Monograph XVI, Part I. **Influenza.** By David Thomson and Robert Thomson. 640 pp. England: Ballière, Tindall and Cox. December, 1933.

For some years the Pickett-Thomson Research Laboratory has been attempting "to organize into a continuous and orderly story on each definite subject" the outpouring of some 10,000 medical journals. The present volume (Part I of Monograph XVI) begins the abstraction of more than 4,000 articles on Influenza.

Outwardly of the appearance of a large city telephone directory, its seven hundred odd pages proceed to cover their subject with equal thoroughness. It is a difficult task. If a good clinician could be employed to abstract the abstracts, the work would be of greater value to the practitioner. To consume a page with the detailed description of a test that has yet to "give a positive result with the serum from an influenza case," or to even mention the observations of a man whose influenza patients—"particularly females, exhibited pyuria as an early symptom" will tend to make the ordinary doctor look elsewhere for his abstracts.

Between three and four hundred pages, devoted to the respiratory florae in influenza, were read rather superficially. Of course none of the various organisms discussed was definitely incriminated as an etiologic agent, and the reviewer's previously chaotic ideas in this respect were still further confused by the mass of conflicting data.

Some good statistical material has been collected and presented. The outstanding impression made

upon the reader is that influenza in its pandemic form has been periodically the greatest enemy of mankind, is not in the least understood at the present time, and is certain to return with unmitigated or enhanced fury in the future. The monograph is therefore a valuable treatise, particularly for those among us who are tempted to gush about the achievements of modern medicine. The year 1918 was an eventful one in human experience. The prevention of the next war, however, is simple in comparison to the prevention of the next pandemic of influenza. Part II will deal with this phase of the subject, but one can hardly expect to find encouragement in the application of such incomplete knowledge as we now possess.

In its completion this monograph will fulfill its prefacial statement that "a detailed historical work on the subject up to the year 1934 need not be written again," and herein lies its greatest value and promise. It is excellently printed, and contains twenty-eight full-page photographic plates.

ABSTRACTS OF PAPERS PRESENTED AT THE THIRTIETH ANNUAL MEETING OF THE NATIONAL TUBERCULOSIS ASSOCIATION AT CINCINNATI, OHIO, MAY 14 TO 17, 1934

Clinical Section

Parenchymal Lesions in Childhood. J. P. Nalbant, M.D., Northville, Mich.

This report is based on the study of 253 cases of pulmonary tuberculosis in children, of whom 120 had childhood type, 120 had adult type, and 13 had generalized and miliary type of disease. Their ages ranged from 1 to 15 years. They all had definite parenchymal areas of infiltration demonstrated by the roentgenogram.

The data are presented in tabular form and reveal several very important facts, the most important of them being the fact that childhood type tuberculosis is a definitely benign disease with a very good prognosis in contrast to the adult type which is progressive with good prognosis only in its minimal stage aided by adequate therapeutic measures. In spite of the good prognosis of childhood type tuberculosis, approximately 7 per cent of the children in this series died, while the mortality rate in adult type cases was 50 per cent. A relatively large number of children with childhood type tuberculosis showed tubercle bacilli in the sputum or feces. This, we believe, is one of the main arguments for hospitalization of these children. It was noted that remissions or acute exacerbations may occur during the course of childhood type tuberculosis, especially in children with positive sputum or faeces. The course of these remissions in our group was very similar to that of the primary infections already present and in the process of healing. Although they were definitely secondary infections of endogenous origin, none of them behaved as adult type lesions and most of them resolved without any collapse therapy.

The importance of early diagnosis and the effect of surgical treatment of adult type lesions on the mortality rate are shown by comparing the number of deaths: namely, 87 per cent, between 1922 and 1926, during which period no surgical therapy was employed, with the number of deaths, about 42 per cent, after 1926, which time marked the beginning of the use of collapse methods for children admitted to our sanatorium.

Considerable hope is extended to the child with miliary tuberculosis of the lungs or generalized tuberculosis, for the reason that of the 13 such cases studied in this report 3 were apparently arrested, 3 were improved, and 7 were dead.

Pathological Section

The Influence of Orange Juice (Vitamin C+), on Experimental Tuberculosis in Guinea-Pigs. Eugene de Savitsch, M.D., J. D. Stewart, Louise Hanson, and E. N. Walsh, Chicago, Ill.

The present experiment was undertaken primarily to determine whether the peculiar resistance of rats to tuberculosis is perhaps correlated with their ability to "manufacture" their own vitamin C. An attempt was made to reproduce the picture by giving tuberculous guinea-pigs a superabundance of vitamin C in the form of orange juice. Twenty-two young male guinea-pigs were inoculated with a lethal dose of human tubercle bacilli. Immediately upon inoculation the pigs were divided into two groups, one of the groups receiving daily by stomach tube 10 cc. of freshly prepared orange juice, the other group being retained as control. Both groups were kept under identical living conditions and were given a generous supply of greens with the stock diet. Treatment was continued for 175 consecutive days, at the end of which the surviving animals were sacrificed and autopsied.

The evaluation of results was made on the basis of weekly weight changes, macroscopic and histological findings. The weight curve was strikingly favorable in the treated group. Macroscopically both groups showed marked lymphadenopathy, but the organ involvement was definitely less in the treated group. In fact, in several treated animals the lesions were limited to the lymph nodes. The histological data confirmed the macroscopic findings, but there was no striking difference in the amount of fibrosis in the treated group as compared with the controls.

A Study of the Increase in Sensitiveness in Normal Children Produced by Repeated Injections of Tuberculin. H. A. Steele, M.D., and H. S. Willis, M.D., Northville, Mich.

It has been assumed generally that tuberculin tests may be given repeatedly to an individual without alteration of his sensitiveness to the product provided he is without tuberculous infection. Observations on 750 clinically non-tuberculous children of average age of slightly below 15 years indicate that previous injection may induce sensitiveness.

Old Tuberculin (O.T.) and Seibert's T.P.T. were used.

In one group of 159 children O.T. was given in ascending doses to non-reactors, until a dilution of 1-10 was reached. In certain of these children the series of tests was repeated in one week; in others it was repeated in one month; in still others, in two months; and in the remainder in three months. In each of the repeat series there was a larger number of reactors than in the first series. The average number of reactors on the interval retests was 16 per cent greater than on first test.

In a group of 420 children tested with T.P.T. and retested as in the O.T. group, there was an increase of 9 per cent on retest over first test. The incidence of reactors in the first series of tests was 52 per cent for O.T. and 76 per cent for T.P.T.

In 131 children a single dose of either O.T. or T.P.T. was given and the same dose repeated in one week. The percentage of increase in the number of reactors was 11.4 on repeat test and of increase in the intensity of the reaction was 16 on retest.

X-ray examination of 100 of these children will be presented.

Studies in Experimental Oleothorax. D. H. Saley, M.D., H. S. Willis, M.D., and Lucia Ellwart, Northville, Mich.

Claims regarding the clinical application of oleothorax show much diversity, and the results are so varying, that this experiment was carried out to determine the response of tissue to oils. Sterile paraffin oil and cottonseed oil, alone and with gomenol in amounts of 1 and 5 per cent, have been injected into the pleural space of rabbits; to date 65 animals have been used. To assure intrapleural injection a small amount of air was put in and pressures recorded prior to the introduction of oil. In one series massive oleothorax was obtained by repeated injections.

The animals were examined at intervals of 24 hours to several months after the operation. No essential difference was seen in the action of either oil with or without the addition of gomenol. The initial result was the outpouring of fibrin which was rather quickly followed by adhesions. Adhesion formation was the constant predominant pathologic finding. Paraffin oil was not absorbed; cottonseed oil tended to be absorbed some weeks after injection and with it adhesions became fewer. Smears and cultures from material obtained intrapleurally were repeatedly sterile. To determine whether or not oil migrated from the pleural space, and if so, by what mechanism, Tieman's soluble blue was added as an emulsion to the oil, and the retromanubrial glands, parietal pleura, lungs, diaphragm, liver, and spleen were examined grossly and microscopically at varying intervals for evidence of the dye.

It is reported that amniotic fluid prevents abdominal adhesions after surgical intervention. May it have the same effect in the pleural space after pneumothorax, pleural effusion, etc? In order to determine this, "Amfetin," amniotic fluid prepared by Eli Lilly, with equal parts of gomenolized oil was injected intrapleurally. Observation, two weeks after, revealed definitely fewer adhesions than were found in animals having oil alone. Further work in this series is in progress.

Tuberculin: Proposal of a Standard Substance for Uniformity in Diagnosis and Epidemiology. Esmond R. Long, M.D., Philadelphia.

A standard tuberculin is essential to the progress of tuberculosis epidemiology at the present time. Tuberculin testing is proceeding in this country on a scale hitherto not approached, and the results seem of great significance. In brief they indicate that old views on the extent of tuberculous infection, and its universality in adult life, are no longer correct. In many parts of the United States today infection is of low incidence in both youth and adult life, if we may trust the figures from tuberculin testing. Statistics from the schools and colleges are particularly interesting, as they show a greater freedom from tuberculous infection in the West than the East, and apparently a steadily increasing drop in both regions. However, we cannot be sure of the comparative value of tuberculin surveys if the preparations of tuberculin used are different.

For some years the Research Committee of the National Tuberculosis Association has sponsored an investigation directed toward the purification of tuberculin and preparation of a standard. This resulted several years ago in the isolation of two somewhat similar purified proteins provisionally called MA 100 and TPT, of high tuberculin potency and well-defined specificity. Objection to their use has been raised, however, on the ground that as whole proteins they may possibly sensitize patients on repeated injection and give rise to falsely positive reactions. This objection has been met by preparing a purified protein derivative whch has all the advantages of the whole proteins, including specificity, high potency and constancy in strength, and which is chemically of considerably smaller molecular weight and does not sensitize. It has been prepared by Florence B. Seibert by a method reported several years ago. In addition to the support from the Research Committee in this work two biological supply houses, Sharp and Dohme and Parke, Davis and Company, have rendered invaluable assistance, and the latter has provided a method enabling unusual convenience in use of the purified product. Details will be presented.

Extensive clinical trial of this preparation has been made by Drs. Aronson, Seibert and Long on about three thousand subjects, including white and colored children and adults in both city and rural communities in Eastern Pennsylvania, Michigan and Puerto Rico. These tests appear to justify its adoption as a general standard which will permit the much-desired correlation of tuberculin results from different parts of the country. Figures obtained in various surveys, in which well-known brands of OT were used for comparison, will be presented.